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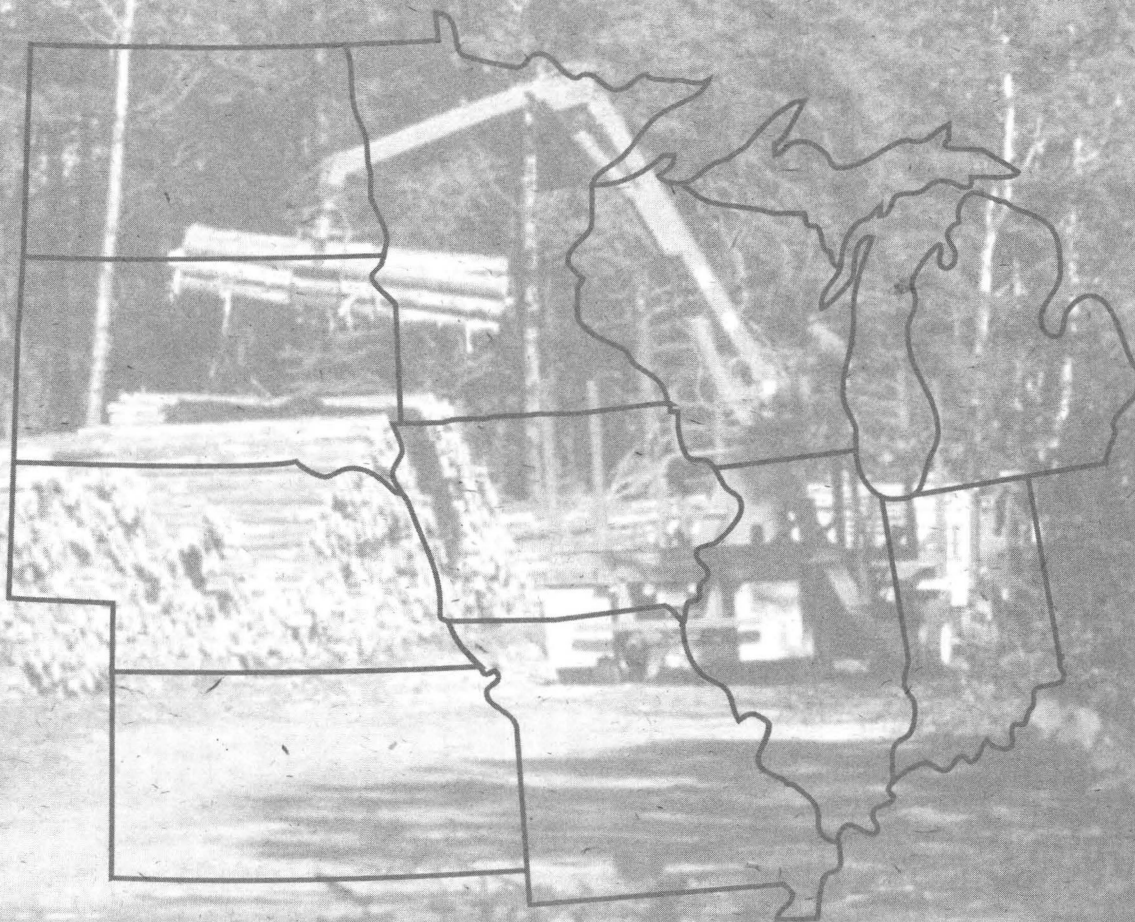
North Central
Research Station

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Pulpwood Production in the North-Central Region, 2002

Ronald J. Piva



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CONTENTS

	Page
Lake States	3
Production	3
Receipts	14
Industry Trends and Analysis	16
Central States	21
Production	21
Receipts	24
Industry Trends and Analysis	24
Plains States	25
Production	25
Appendix	27
Conversion Factors Used in the North-Central Region	27
Table Titles	28
Tables	29

Pulpwood Production in the North-Central Region, 2002

Ronald J. Piva

NOTE: This report includes all primary products made from reconstituted wood fiber. In addition to wood pulp, this includes particleboard and engineered lumber products made from chips, shavings, wafers, flakes, strands, and sawdust. This report presents the production of the raw fiber material delivered to mills. Thus, these data report only that portion of the timber harvest used as raw material and do not necessarily reflect the volume of growing stock harvested.

Pulpwood constitutes more than half the industrial timber products harvested annually in the Lake States (Michigan, Minnesota, and Wisconsin) and is an important product in the Central States (Illinois, Indiana, Iowa, and Missouri) and the Plains States (Kansas, Nebraska, North Dakota, and South Dakota).

Current detailed information about pulpwood production¹ is necessary for intelligent planning and decisionmaking in wood procurement, forest resource management, forest industry development, and scientific studies.

Since 1979, logs, bolts, and wood residue used in manufacturing flakeboard, waferboard, oriented strandboard, and medium-density fiberboard have been included in this annual report. Engineered lumber was first included in this report in 1992. Together, these products are called particleboard, and all mills manufacturing these boards are called particleboard mills in this report. Wood used at particleboard mills is identical or nearly identical to wood used at pulp mills; therefore, including this wood in our study provides a more accurate estimate of demand for pulpwood-like material.

Particleboard mills were in their infancy before 1979 and used primarily aspen and wood residue. Therefore, data for these mills do not distort roundwood use trends for other species or preclude comparing 2002 survey results with those of 1978 and previous years.

Pulp and particleboard mills using timber from the North Central States in 2002 reported their pulpwood receipts² by species group and county of origin. This report presents the results of the survey, analyzes the data, compares results with those of 2001 and earlier years, and discusses trends in pulpwood production and use.

The Lake States, Central States, and Plains States are discussed separately because the timber types in each area are different, the flow of wood between the areas is nominal, and more detailed data on pulpwood production and receipts in the Central and Plains States might reveal the operations of individual mills. This is the 44th annual report of the pulpwood harvest in Lake States counties, the 43rd annual report of the Central States harvest, and the 10th report of the pulpwood harvest in the Plains States.

About the Author:

Ronald J. Piva, Forester, received a B.S. in forest management from the University of Missouri-Columbia. He joined the Forest Service in 1987 and has been working with the North Central Station's Forest Inventory and Analysis unit since.

¹ Pulpwood production, determined from mill receipts, is the annual volume of pulpwood cut, plus the annual wood residue volume produced by sawmills, veneer mills, etc. used for pulp, particleboard, waferboard, oriented strandboard, medium-density fiberboard, or engineered lumber.

² Pulpwood receipts are the volumes of wood received by mills in a specific State or region, regardless of the geographic source.

Several mills purchase their pulpwood based on weight rather than volume. Factors used to convert green tons of pulpwood to standard cord equivalents are shown in the appendix.

When new surveys are completed, errors and omissions from previous surveys are corrected. As a result of our ongoing efforts to improve the survey's efficiency and reliability, changes may have been made to the previous survey's data. All comparisons and analysis in this report are based on the reprocessed data from earlier surveys, which may not match earlier published data.

LAKE STATES

PRODUCTION

- Pulpwood production in the Lake States rose from 9.0 million cords³ in 2001 to 9.4 million cords in 2002, an increase of 4 percent. Overall, 90 percent came from roundwood (including chips from roundwood) and 10 percent came from the residue⁴ of wood-using plants (fig. 1).
- Hardwood material—both roundwood and residues—constituted 78 percent of the total pulpwood production.
- Aspen remained the dominant species harvested for pulpwood in the Lake States in

2002, with 3.8 million cords, or 40 percent of the total roundwood. Other important species harvested for pulpwood in 2002 were soft maple (879 thousand cords), hard maple (796 thousand cords), white birch (488 thousand cords), jack pine (460 thousand cords), and red pine (337 thousand cords) (table 1).

- Softwood roundwood production decreased by 10 percent, falling from 1.8 million cords in 2001 to 1.6 million cords in 2002. Pulpwood production from softwood residues increased by 22 percent to 429 thousand cords in 2002 (fig. 2).

³ All references to cords are in standard cords. A standard cord is 128 cubic feet of wood, bark, and air space.

⁴ Residue is the byproduct from sawmills, veneer mills, cooperage mills, and other wood-using mills that is used for pulping and particleboard. Residue includes slabs, edgings, veneer cores, sawdust, fines, woodflour, and chips manufactured from slabs, edgings, and veneer cores.

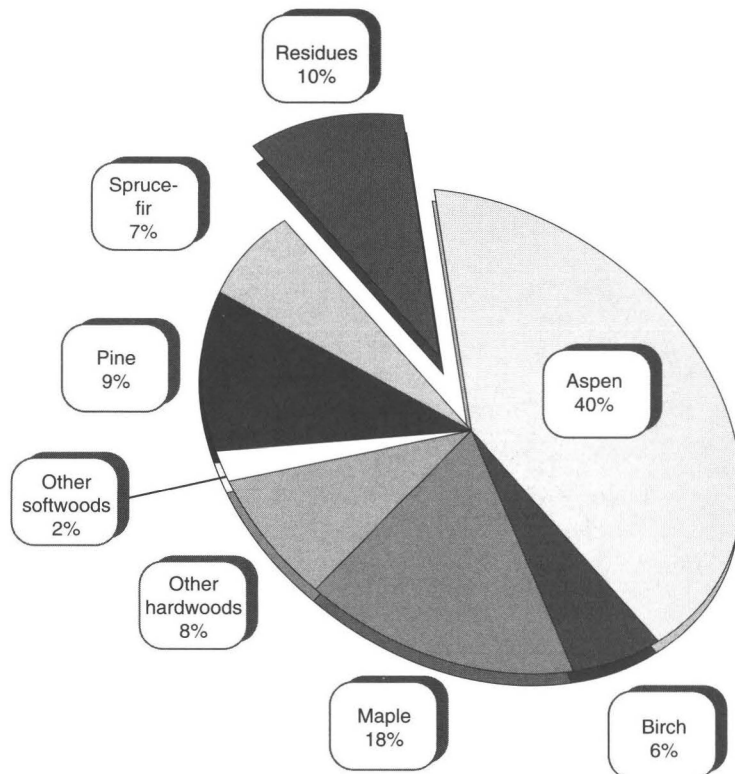


Figure 1.—Lake States pulpwood production by species group and residues, 2002.

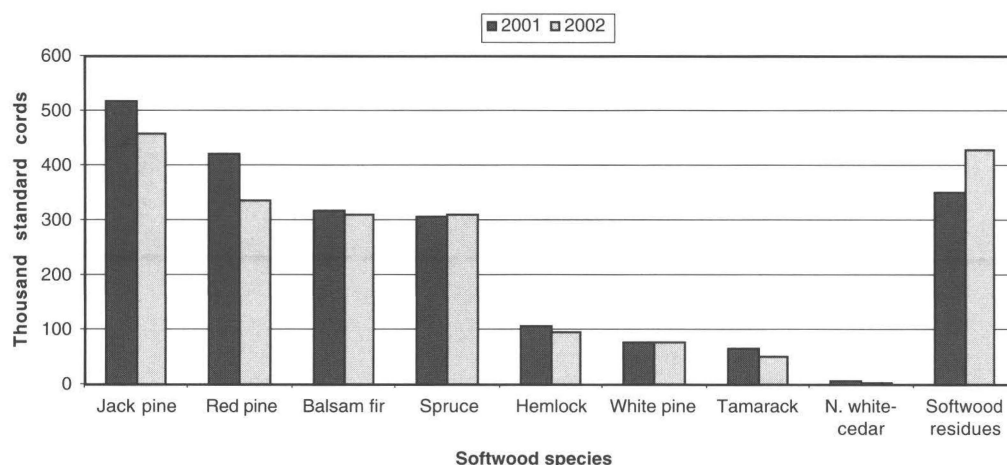


Figure 2.—Softwood pulpwood production in the Lake States, 2001-2002.

- Hardwood roundwood production increased by 8 percent, from 6.3 million cords in 2001 to 6.8 million cords in 2002. Pulpwood production from hardwood residue decreased by 6 percent during the same period (fig. 3).
- Whole-tree chip⁵ (WTC) production, at 678 thousand cords, made up 7 percent of the total pulpwood production in the Lake States in 2002. Compared to 2001 production levels, hardwood WTC production in 2002 increased by almost 8 percent while softwood WTC production decreased by 10 percent (fig. 4).
- Aspen was the predominant species used in WTC in 2002 with 285 thousand cords or 42 percent of the total WTC production. Jack pine, at 61 thousand cords, was the predominant softwood species used in WTC in 2002 and accounted for 9 percent of the total WTC production.
- Michigan was the major producer of WTC in the Lake States in 2002 with 344 thousand cords (51 percent of the WTC production) (fig. 5).

⁵ Pulpwood produced from chipping entire trees (all portions of the trees above ground, except the stumps).

Michigan

- Michigan's total output of wood material for pulpwood production in 2002 remained at the 2001 level of 2.9 million cords (fig. 6, table 2).
- Roundwood production for pulpwood rose to almost 2.5 million cords in 2002, an increase of 5 thousand cords from 2001 (table 3).
- The Western Upper Peninsula remained the top-producing pulpwood region in the State in 2002 with 38 percent of the total roundwood harvested (fig. 7, tables 4 and 5).
- From 2001 to 2002, roundwood pulpwood production increased by 15 percent in the Southern Lower Peninsula, increased by 5 percent in the Northern Lower Peninsula, and decreased by nearly 3 percent in both the Eastern Upper Peninsula and the Western Upper Peninsula.
- The production of pulpwood from residues produced in Michigan decreased by less than 1 percent, falling from 452 thousand cords in 2001 to 448 thousand cords in 2002.

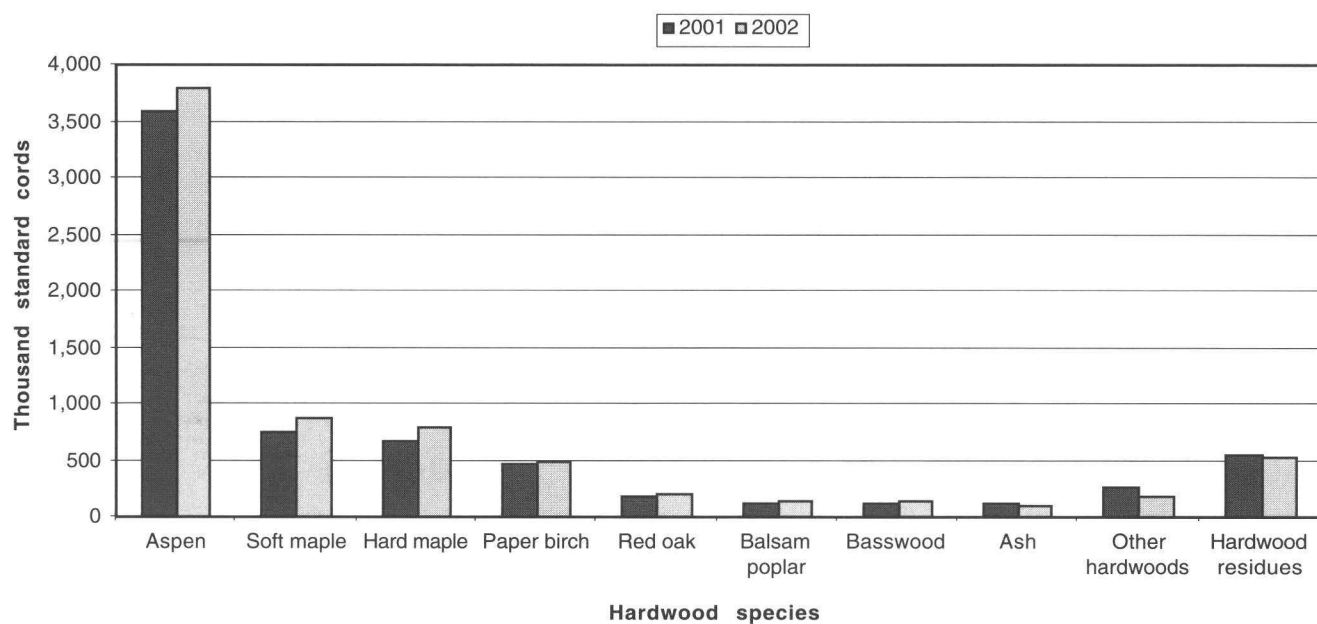


Figure 3.—Hardwood pulpwood production in the Lake States, 2001-2002.

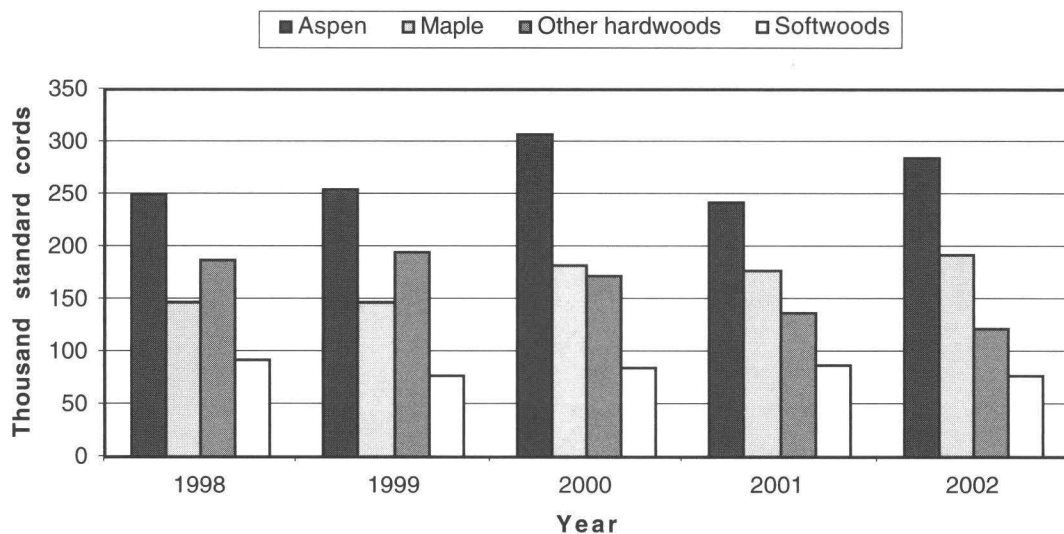


Figure 4.—Whole-tree chip production in the Lake States, 1998-2002.

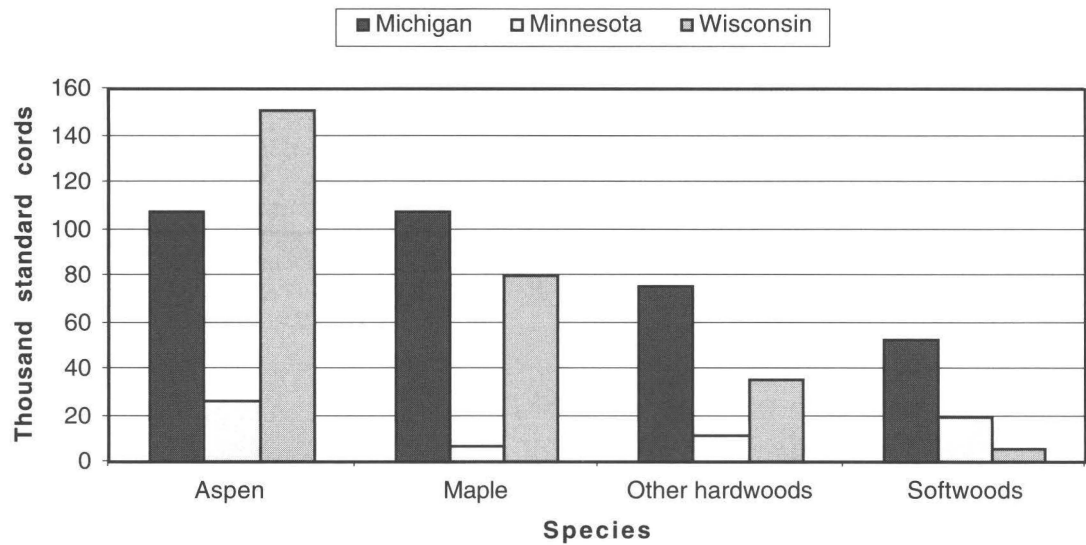


Figure 5.—Whole-tree chip production by State in the Lake States, 2002.

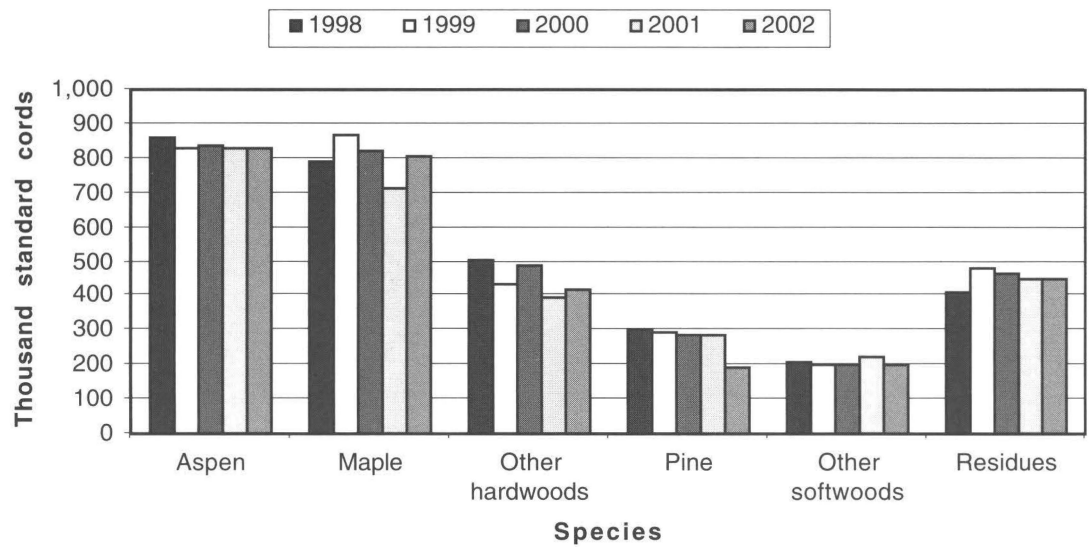


Figure 6.—Michigan pulpwood production by species group and residues, 1998-2002.

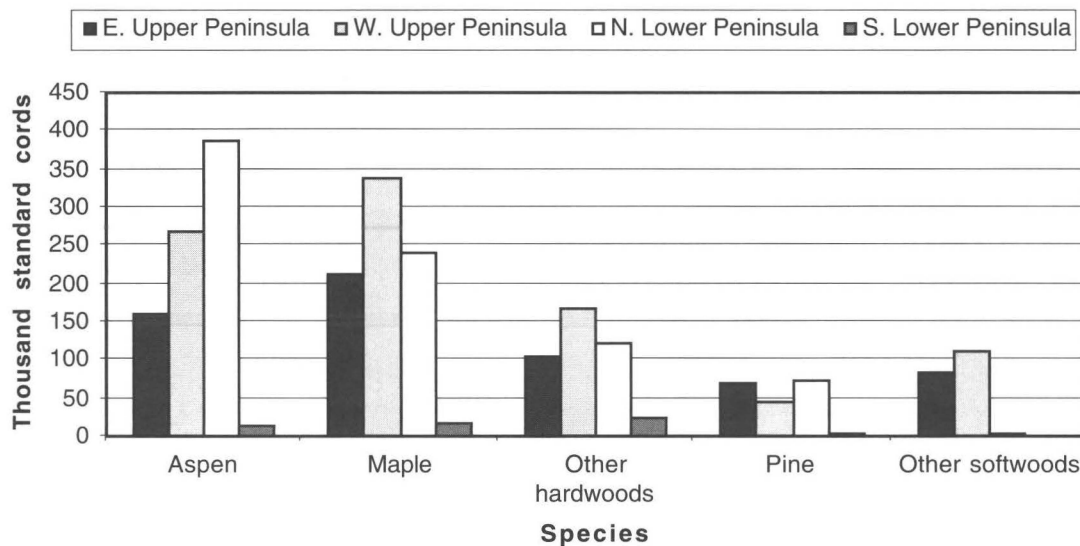


Figure 7.—Michigan roundwood pulpwood production by Forest Survey Unit and species groups, 2002.

Minnesota

- Pulpwood production increased by 6 percent between 2001 and 2002, from 2.8 million cords in 2001 to 3.0 million cords in 2002 (fig. 8).
- Hardwoods accounted for 79 percent of the total pulpwood produced in 2002.
- Ninety-six percent of the pulpwood produced in Minnesota in 2002 came from roundwood sources.
- The Northern Pine and the Aspen-Birch Forest Survey Units were the top pulpwood-producing roundwood regions in the State in 2002 with almost 1.4 million cords and 1.2 million cords, respectively (fig. 9, table 6).
- Aspen accounted for 68 percent of all the roundwood harvested for pulpwood in Minnesota in 2002.
- From 2001 to 2002, softwood residues produced in Minnesota and used for pulpwood production increased by 37 percent and hardwood residue production increased by 21 percent.

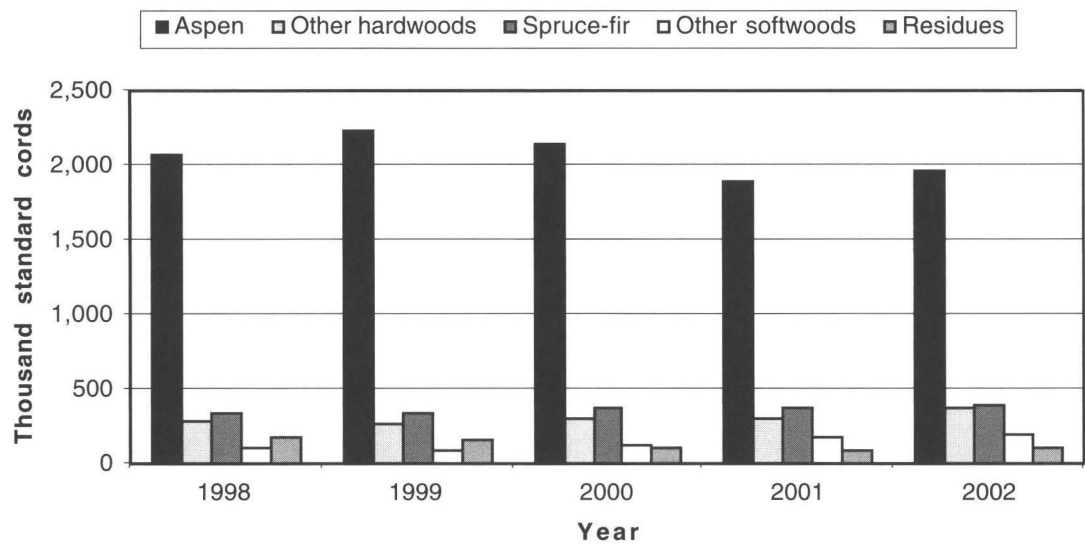


Figure 8.—Minnesota pulpwood production by species group and residues, 1998-2002.

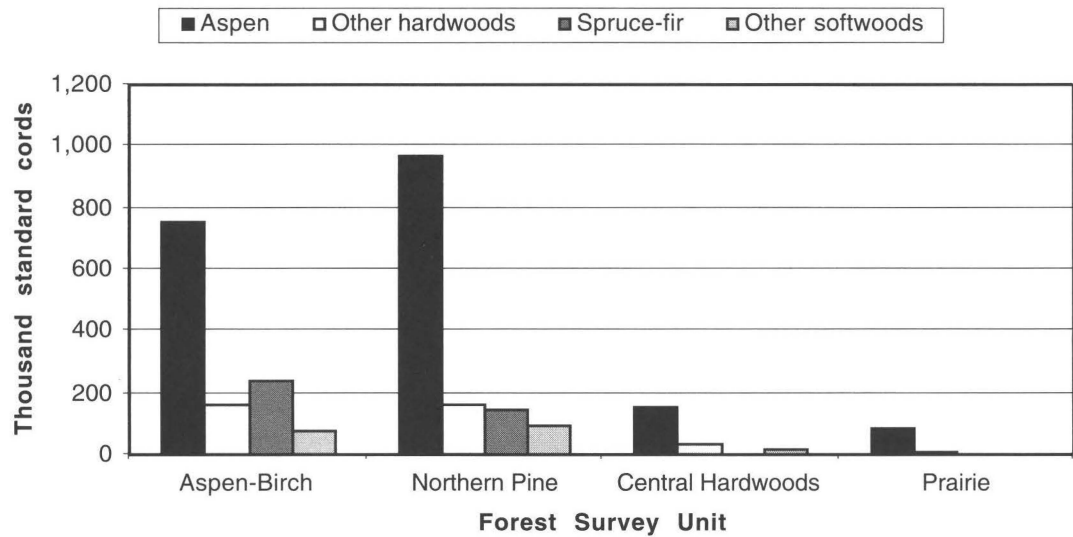


Figure 9.—Minnesota roundwood pulpwood production by Forest Survey Unit and species group, 2002.

Wisconsin

- Pulpwood production in Wisconsin increased by 5 percent between 2001 and 2002, from 3.3 million cords to almost 3.5 million cords (fig. 10).
- Hardwood material accounted for 77 percent of the total pulpwood production in 2002.
- Roundwood harvested for pulpwood accounted for almost 89 percent of the pulpwood produced in 2002.
- The Northwestern Forest Survey Unit remained the top producer of roundwood for pulping in the State with 1.3 million cords (fig. 11, table 7).
- In 2002, softwood residues produced in Wisconsin and used for pulpwood production increased by 35 percent while hardwood residues decreased by 2 percent from the previous year.

Harvesting Intensity

- In the following figures, the distribution of the harvest is shown in two ways: first, the amount of pulpwood cut relative to the growing-stock volume in each of five major pulpwood species (fig. 12); second, the amount of pulpwood relative to commercial timberland area (fig. 13).

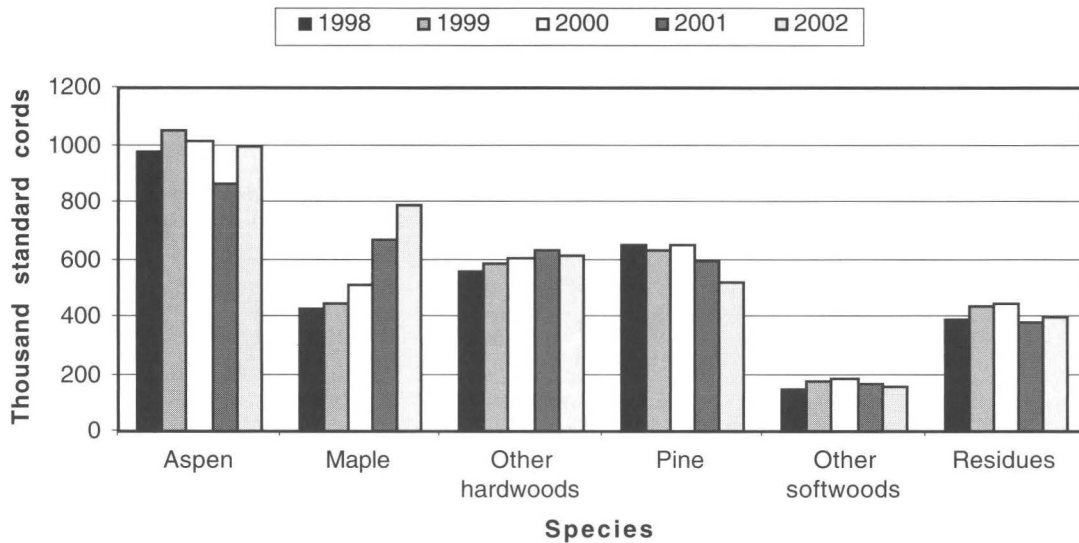


Figure 10.—Wisconsin pulpwood production by species group and residues, 1998-2002.

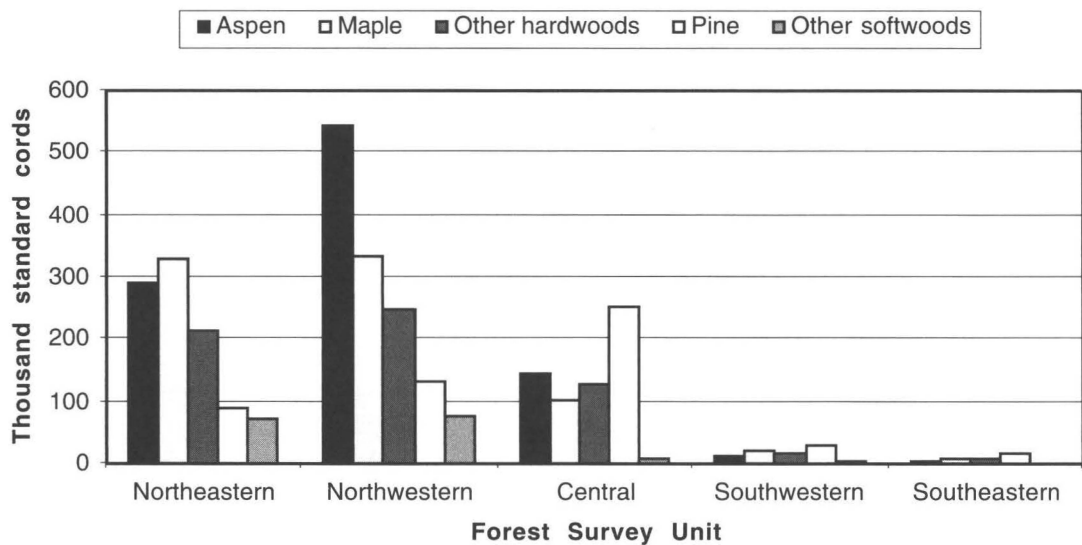


Figure 11.—Wisconsin roundwood pulpwood production by Forest Survey Unit and species group, 2002.

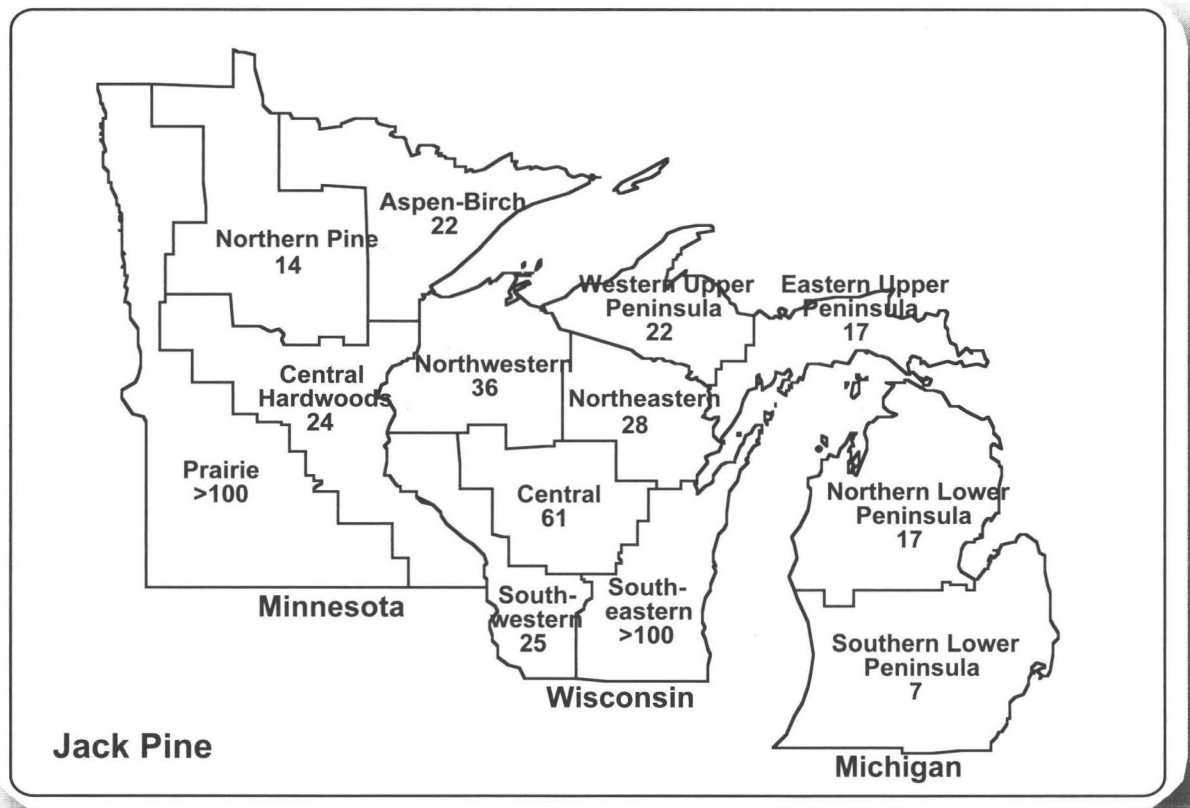
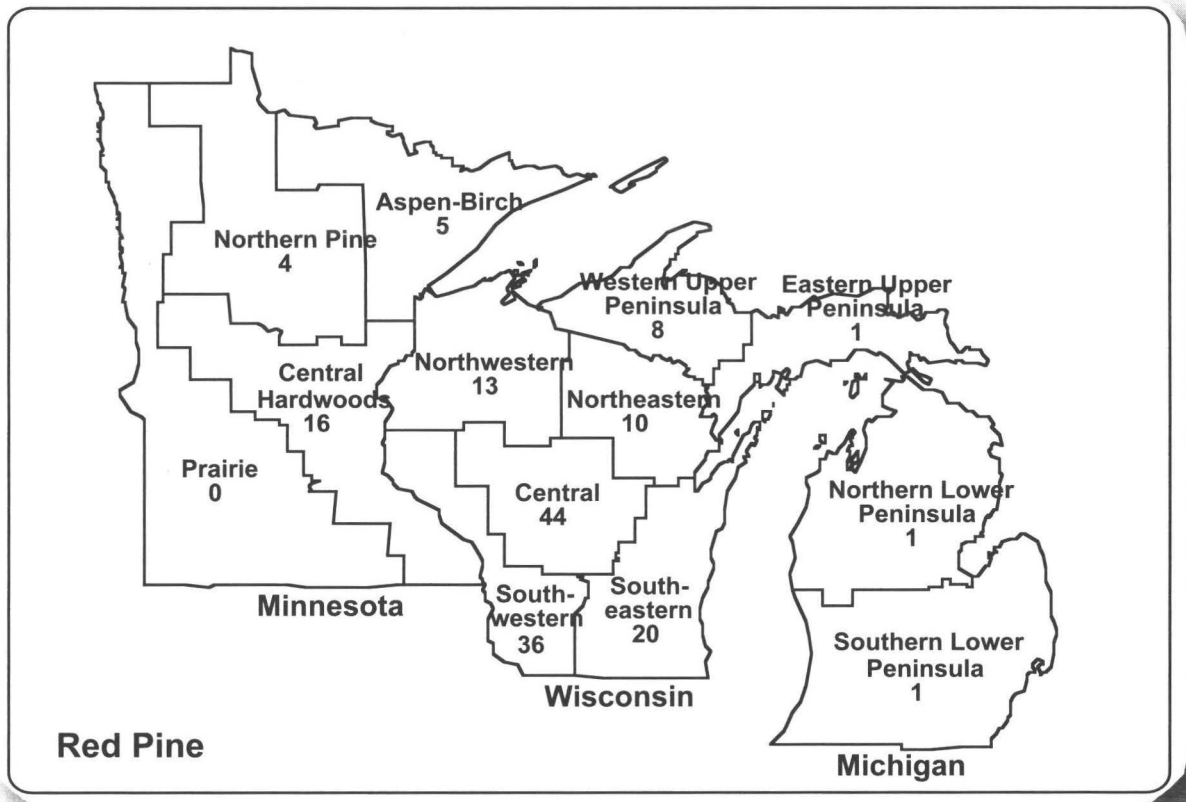
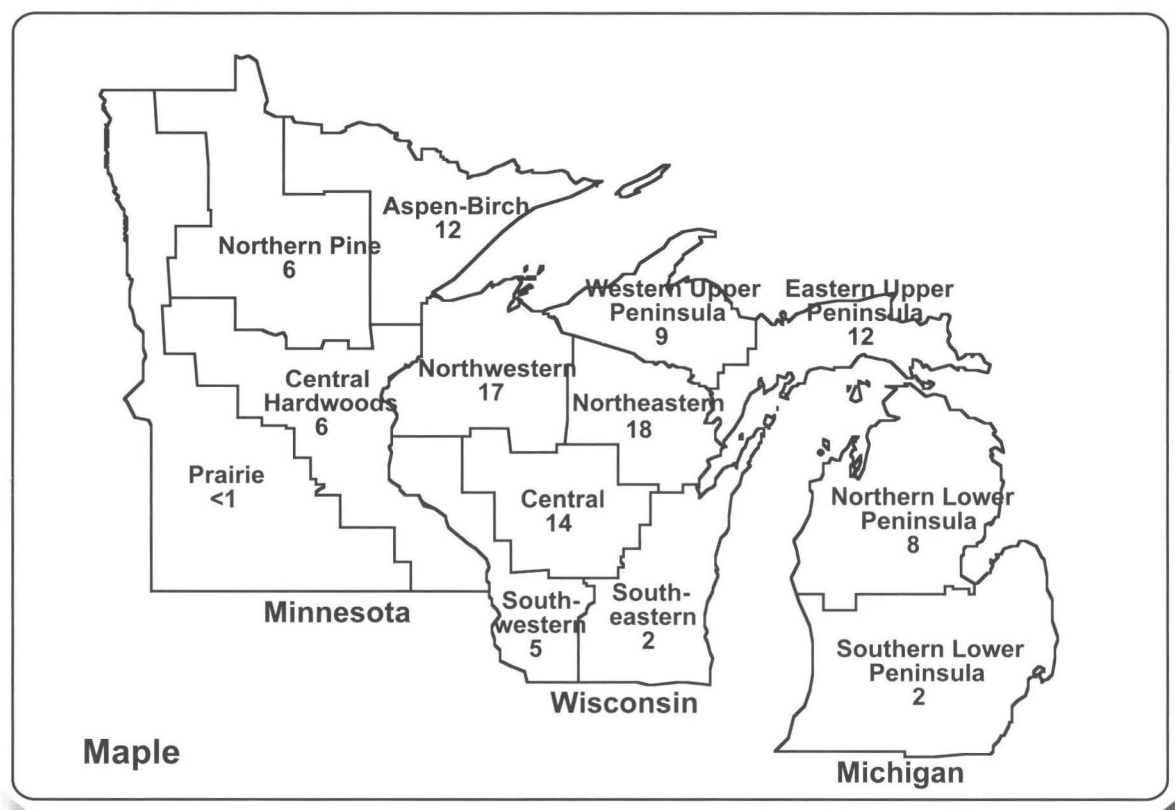
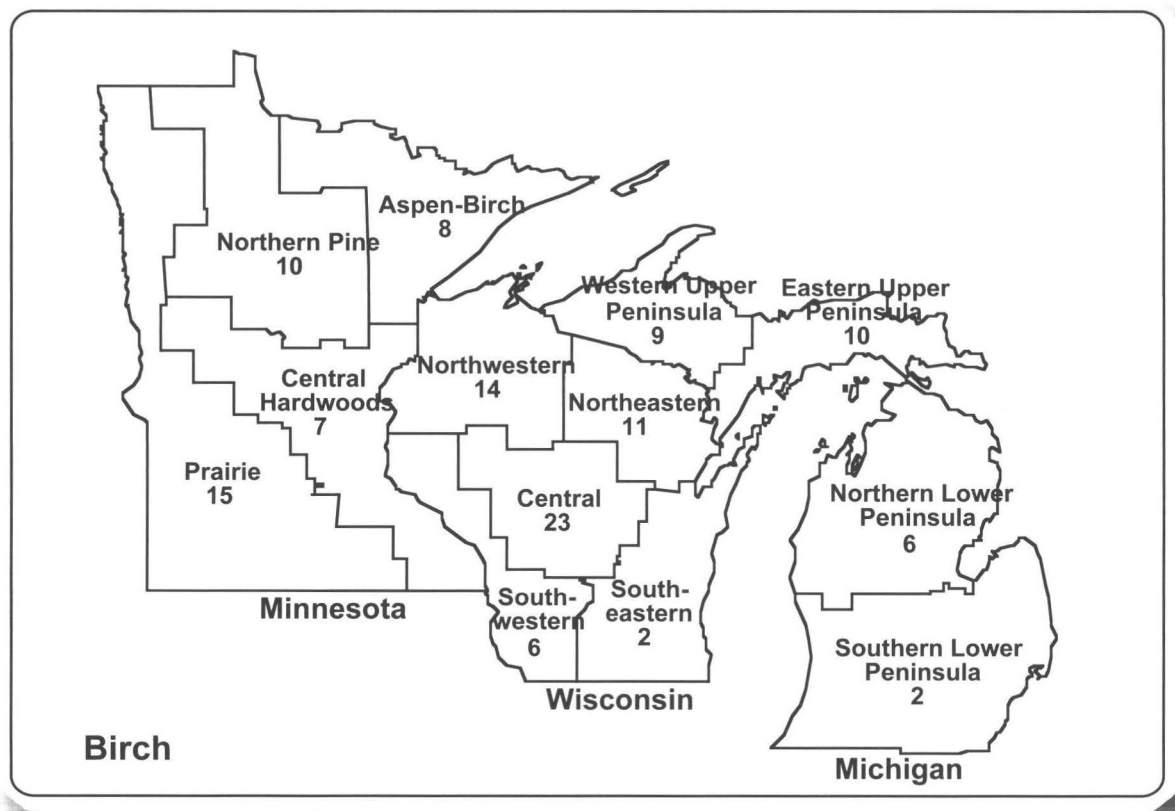


Figure 12.—Cords of roundwood pulpwood (including chips from roundwood) harvested per 1,000 cords of growing-stock volume for each of five principal pulpwood species by Forest Survey Unit, 2002. Growing-stock volume was determined during the last forest inventory for each State.





LAKE STATES

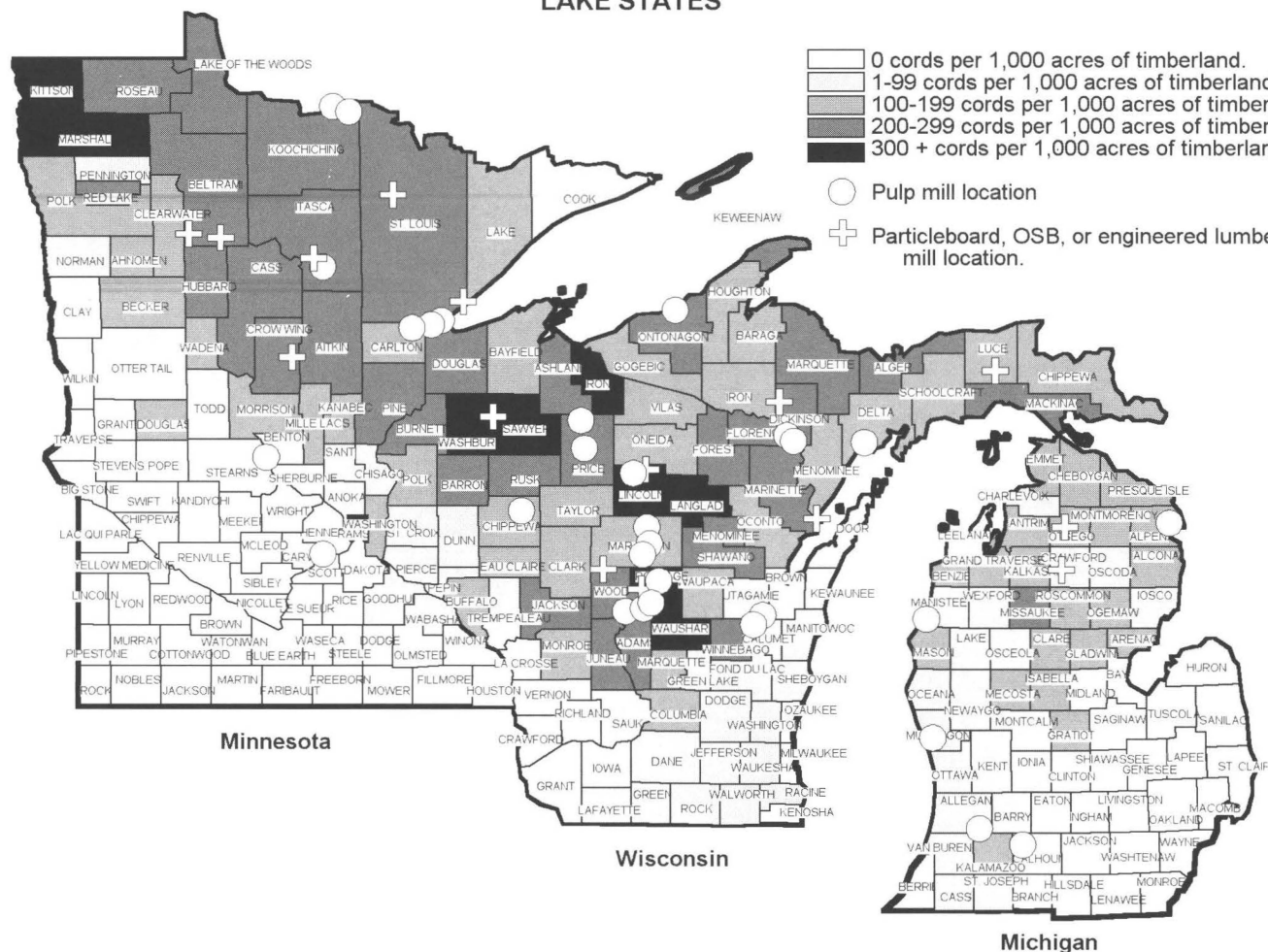


Figure 13.—Cords of pulpwood cut per 1,000 acres of timberland by county, 2002. Acres of timberland (stocking of trees greater than 10 percent) were determined during the last inventory in each State. Locations of active pulp and particleboard mills are shown.

Pulpwood harvesting was most intensive (100,000 cords or more) in the following Forest Survey Units by species:

Species	State	Forest Survey Unit
Red pine	Wisconsin	Central
Spruce	Minnesota	Aspen-Birch
Aspen	Michigan	N. Lower Peninsula, W. Upper Peninsula, E. Upper Peninsula
	Minnesota	Northern Pine, Aspen-Birch, Central Hardwoods
	Wisconsin	Northwestern, Northeastern, Central
White birch	Wisconsin	Northwestern
Hard maple	Michigan	W. Upper Peninsula, E. Upper Peninsula
	Wisconsin	Northeastern, Northwestern
Soft maple	Michigan	N. Lower Peninsula, W. Upper Peninsula, E. Upper Peninsula
	Wisconsin	Northwestern, Northeastern

RECEIPTS

- In 2002, 30 wood pulp and 14 particleboard mills in the Lake States acquired 9.9 million cords of pulpwood, an increase of almost 3 percent from 2001.
- Aspen roundwood was processed at 35 of the 44 pulp and particleboard plants in the Lake States in 2002 (fig. 14, table 8).
- In 2002, Wisconsin supplied wood to 34 mills, Michigan supplied 32 mills, and Minnesota supplied 25 mills.
- Total imports from outside the Lake States of all wood material in 2002 were 577 thousand cords, a decrease of 16 percent from 2001. Canada contributed almost 85 percent of the total import receipts.

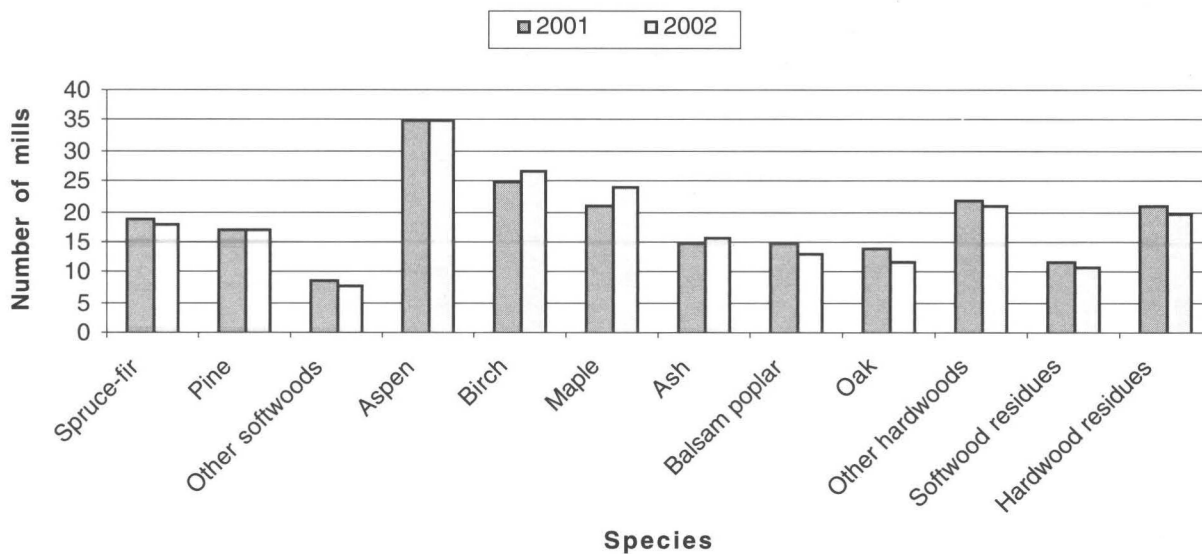


Figure 14.—Numbers of industrial plants in the Lake States using a particular species or residue for pulping and particleboard, 2001-2002.

- Imports of aspen roundwood from Canada to Lake States pulp and particleboard mills decreased by 28 percent in 2002, going from 402 thousand cords in 2001 to 290 thousand cords in 2002.
- Imports of residues decreased by almost 19 percent between 2001 and 2002. The Plains States and Canada supplied 82 percent of the total residues imported by mills in the Lake States.

Michigan

- The seven Michigan pulp mills, three OSB mills, and one particleboard mill consumed almost 3.0 million cords in 2002, almost 2 percent more than the previous year. Eleven percent of the total wood material consumed was imported from out of State, with Wisconsin supplying 75 percent of the imported wood material.

Minnesota

- The eight pulp mills, five OSB mills, and one laminated structural lumber mill in Minnesota reported consuming almost 3.6 million cords in 2002, an increase of 10 percent from 2001. Minnesota's pulp and particleboard mills acquired 19 percent of their raw material from out-of-State sources. Wisconsin supplied over 50 percent of the imported wood material.

Wisconsin

- The 15 pulp mills, 2 OSB mills, and 2 particleboard mills in Wisconsin consumed 3.4 million cords in 2002, a decline of almost 4 percent from 2001. Almost 17 percent of the total receipts were imported from out of State, with 45 percent of the total wood material imported from Michigan.

INDUSTRY TRENDS AND ANALYSIS

Pulp Mills

For this section, pulp mill products include wood fiber products such as paper, paperboard, hardboard, insulation board, and medium-density fiberboard. All of these products are manufactured from wood that has been reduced to individual fibers, small fiber bundles, or fiber parts that are subsequently formed into a mat. Wood material from the Lake States sent to mills in other States and Canada is included.

- Of the 9.0 million cords of pulpwood produced in the Lake States in 2002, almost 6.8 million cords (72 percent) were used for wood pulp products. Overall, 88 percent came from roundwood and 12 percent came from mill residues.
- Principal species harvested for pulp in the Lake States in 2002 were aspen (1.9 million cords), soft maple (780 thousand cords), hard maple (760 thousand cords), and jack pine (253 thousand cords) (fig. 15).
- Hardwoods were still the mainstays of the pulp mills in the region in 2002 with hardwood roundwood contributing almost 65 percent of total raw material needs and hardwood residues supplying another 7 percent.
- Lake States softwood roundwood production for pulp mills increased by 10 percent between 2001 and 2002. Softwood residues from the Lake States primary wood processors used by pulp mills decreased by almost 14 percent from the previous year.
- Average daily wood pulp production in 2002 rose to 14.6 thousand tons of pulp per day, up from 14.3 thousand tons per day in 2001 (table 9).
- Lake States pulpwood production for pulp mills during the period 1998-2002 is shown in table A.

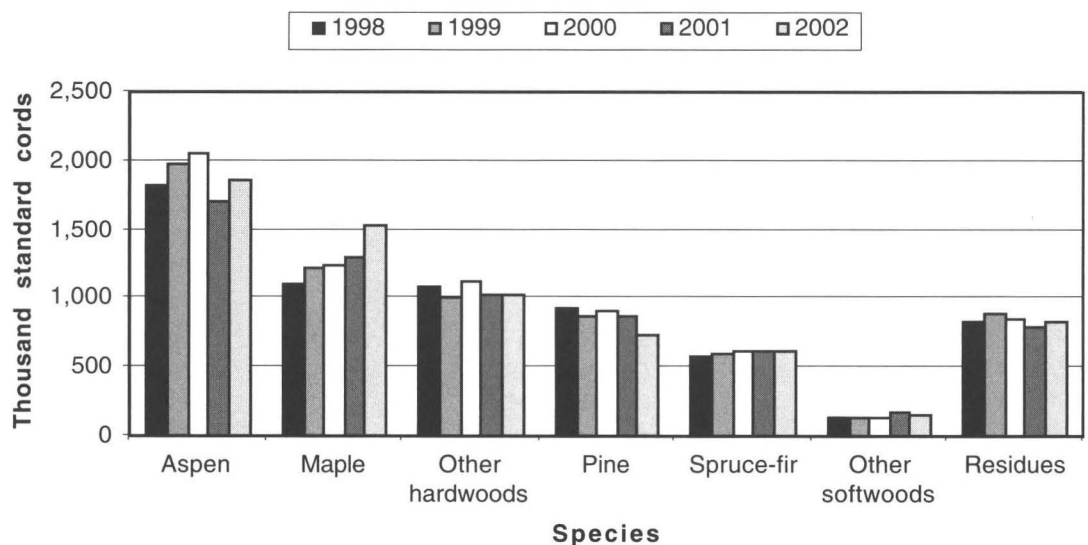


Figure 15.—Pulpwood production in the Lake States for pulp by species group and residues, 1998-2002.

Table A.—*Lake States pulpwood production for pulp mills, 1998-2002*

Product form and species group	Production				
	1998	1999	2000	2001	2002
----- (Thousand cords) -----					
Roundwood					
Softwoods	1,627	1,599	1,674	1,658	1,500
Aspen	1,825	1,981	2,045	1,707	1,854
Other hardwoods	2,198	2,232	2,354	2,320	2,573
Residue	813	867	852	804	825
Total	6,463	6,680	6,925	6,488	6,753

Michigan

- Pulpwood production for wood pulp was 2.1 million cords in 2002, an increase of 1 percent from 2001. Michigan had the smallest increase of wood pulp production of the three Lakes States in 2002.
- Soft maple, hard maple, and aspen were the major pulpwood species groups harvested in the State in 2002. All together, these three species groups accounted for over 60 percent of the total roundwood harvested.
- Michigan mills imported 239 thousand cords of pulpwood, or 12 percent of the wood material used for the production of wood pulp by Michigan wood pulp mills. Michigan exported almost 263 thousand cords to wood pulp mills in Minnesota, Wisconsin, and Canada.
- Michigan mills used almost 1.7 million cords of hardwood material in 2002, an increase of almost 9 percent from 2001. The use of softwood material decreased by 20 percent to 388 thousand cords during the same period.

Minnesota

- Pulpwood production for wood pulp totaled 1.7 million cords in 2002, an increase of 6 percent from 2001.
- In 2001, aspen remained the predominant species harvested in the State with almost 892

thousand cords, or 56 percent of the total roundwood produced. Other major species harvested were spruce with 215 thousand cords and balsam fir with 166 thousand cords.

- Mills in Minnesota imported 553 thousand cords of wood material for pulp products (359 thousand cords from Wisconsin, 184 thousand cords from Canada, and 10 thousand cords from Michigan). Minnesota exported 112 thousand cords to pulp mills in Wisconsin and 11 thousand cords to pulp mills in Canada.
- Minnesota mills had a 10-percent increase in the use of hardwood material, from 1.4 million cords in 2001 to 1.6 million cords in 2002. The use of softwood material increased by 19 percent to 560 thousand cords in 2002.

Wisconsin

- Pulpwood production for wood pulp products increased by 5 percent, from 2.9 million cords in 2001 to 3.0 million cords in 2002.
- Aspen was the main species harvested with 622 thousand cords. Other major species harvested were hard maple (407 thousand cords), soft maple (368 thousand cords), red pine (243 thousand cords), white birch (211 thousand cords), and jack pine (199 thousand cords).
- Wisconsin mills imported 483 thousand cords of pulpwood: 231 thousand cords from Michigan, 112 thousand cords from Minnesota,

76 thousand cords from other States, and 64 thousand cords from Canada. Wisconsin exported 359 thousand cords to Minnesota, 217 thousand cords to Michigan, and 6 thousand cords to other States and Canada combined.

- Wisconsin pulp mills decreased the use of hardwood material by less than 2 percent between 2001 and 2002 and decreased the use of softwood material by 11 percent.

Particleboard Mills

Particleboard is a generic term for a panel manufactured from lignocellulosic material commonly wood essentially in the form of particles (as distinct from fibers). These materials are bonded together with synthetic resin or other suitable binder under heat and pressure by a process wherein the inter particle bonds are created wholly by the added binder. Other materials may have been added during manufacture to improve certain properties. The many types of particleboard differ greatly in regard to size and geometry of the particle, the amount of resin (adhesive) used, and the density to which the panel is pressed. Products included in the particleboard group include particleboard, waferboard, oriented strandboard (OSB), and engineered lumber. The major types of particles used for particleboard are shavings, flakes, wafers, chips, sawdust, strands, slivers, and wood wool (excelsior). Much of the particleboard in the U.S. is made from residues (shavings, sawdust, or chips). Waferboard, OSB, and engineered lumber are examples of products requiring that the particles be cut from solid wood (saw logs or pulpwood). Wood material from the Lake States sent to mills in other States and Canada is included.

- The Lake States produced 2.6 million cords of pulpwood in 2002 for particleboard products, up 2 percent from 2001. For every cord of pulpwood used in particleboard manufacture, 95 percent came from roundwood and 5 percent came from the residues of other wood-using plants.
- Principal species harvested for particleboard products were aspen (1.9 million cords), white birch (169 thousand cords), jack pine (108 thousand cords), and soft maple (99 thousand cords) (fig. 16).
- In 2002, the Lake States produced 149 thousand cords of softwood roundwood and 2.4 million cords of hardwood roundwood for processing at particleboard plants. Roundwood production for the manufacture of particleboard products rose by almost 3 percent between 2001 and 2002. All the roundwood that was harvested in the Lake States for particleboard production stayed in the region.
- The Lake States in 2002 produced 51 thousand cords of softwood residues and 78 thousand cords of hardwood residues for use in particleboard production. Between 2001 and 2002, the use of residues for particleboard production increased by 19 percent.
- Annual production at Lake States particleboard plants rose from 1,987 million square feet 3/4-inch basis in 2001 to 2,015 million square feet 3/4-inch basis in 2002 (table 10).
- Lake States pulpwood production for particleboard mills during 1998-2002 is shown in table B.

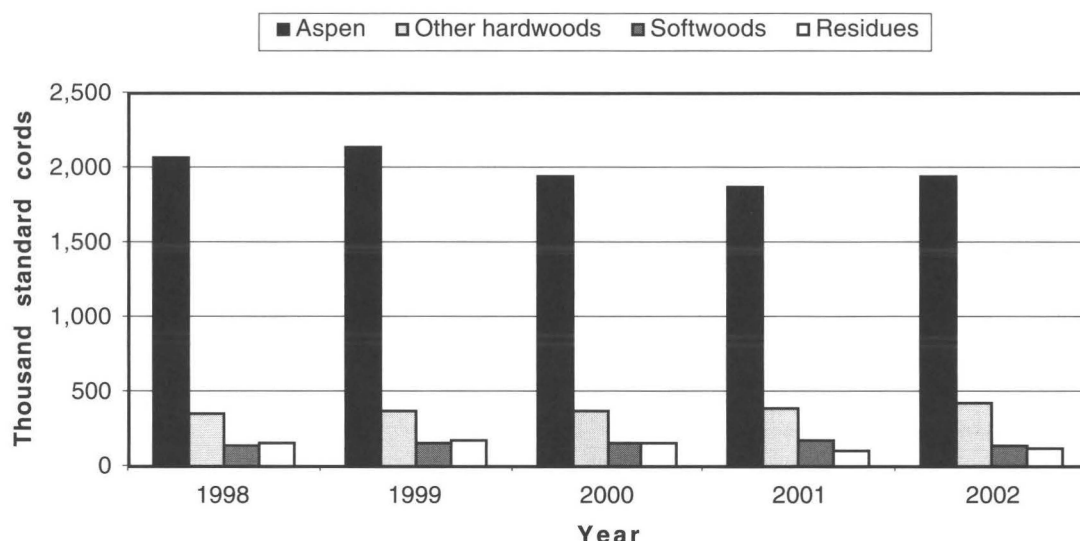


Figure 16.—Pulpwood production for particleboard in the Lake States, 1998-2002.

Michigan

- Michigan's production of wood material for particleboard production decreased by almost 3 percent from 2001 to 2002, falling from 856 thousand cords in 2001 to 832 thousand cords in 2002.
- In 2002, the harvest of roundwood from Michigan forest land provided 766 thousand cords of wood for particleboard products, of which 81 thousand cords were softwoods and 684 thousand cords were hardwoods. Residues from Michigan's primary wood-using mills provided another 66 thousand cords of wood material that were used for particleboard products.

- The particleboard mills in Michigan imported 60 thousand cords from Canada and 39 thousand cords from Wisconsin. Exports of all wood material for particleboard production amounted to 22 thousand cords, all of which went to Wisconsin.

Minnesota

- The production of wood material for particleboard production in Minnesota increased by almost 6 percent from 2001 to 2002, rising from 1.2 million cords in 2001 to 1.3 million cords in 2002.
- Minnesota accounted for almost half of all the wood material produced in the Lake States for

Table B.—Lake States pulpwood production for particleboard mills, 1998-2002

Product form and species	Production				
	1998	1999	2000	2001	2002
- - - - - (Thousand cords) - - - - -					
Roundwood					
Softwoods	135	152	159	174	149
Aspen	2,078	2,139	1,939	1,880	1,938
Other hardwoods	362	380	374	396	431
Residue	172	205	156	108	129
Total	2,748	2,876	2,628	2,558	2,647

particleboard plants in 2002. Roundwood logged for particleboard products totaled 1.3 million cords, and aspen was the predominant species cut (1.1 million cords). Minnesota supplied less than 1 thousand cords of mill residues for particleboard production.

- The particleboard mills in Minnesota imported 129 thousand cords from Canada and 6 thousand cords from Wisconsin and North Dakota combined. In 2002, raw materials exported from the State for particleboard manufacturing totaled 27 thousand cords, all of which went to Wisconsin.

Wisconsin

- The production of wood material for particleboard production in Wisconsin increased by 8 percent from 2001 to 2002, rising from 457 thousand cords in 2001 to 495 thousand cords in 2002.
- In 2002, Wisconsin forest land produced 431 thousand cords of roundwood for particleboard manufacturing, of which 17 thousand cords were softwood and 414 thousand cords were hardwood. Wisconsin's primary wood processing mills provided an additional 63 thousand cords of plant byproducts to the particleboard industry.
- The mills in Wisconsin imported almost 85 thousand cords of wood for particleboard manufacturing: 36 thousand cords from Canada, 27 thousand cords from Minnesota, and 22 thousand cords from Michigan. Wisconsin exported 39 thousand cords to Michigan particleboard mills and 1 thousand cords to Minnesota particleboard mills in 2002.

Industry News

Major mill expansion, new construction, consolidations, name changes, and closures are as follows:

- Johnson Controls medium-density fiberboard mill at Battle Creek, MI, switched from processing peeled roundwood to market pulp in May 2001.
- Domtar Inc. purchased the Georgia-Pacific Corp.'s pulp mills in Nekoosa and Port Edwards, WI, in August 2001. The two mills' names were changed to Domtar Industries, Inc.
- Appleton Coated LLC's pulp mill at Combined Locks, WI, was closed in December 2001.
- Georgia-Pacific Corp.'s hardboard pulp mill at Superior, WI, was closed in December 2001.
- Cornell Felt Acquisition of Beloit bought the Globe Building Materials plant at Cornell, WI, in January 2001. Mule-Hide Dry Felt Manufacturing, a subsidiary of ABC Supply Co. in Beloit, leased and began operating the plant in March 2002.

CENTRAL STATES

PRODUCTION

- Pulpwood production in the Central States (Illinois, Indiana, Iowa, and Missouri) decreased by 9 percent—from 469 thousand cords in 2001 to 427 thousand cords in 2002.
- The Central States' pulpwood production from both roundwood and residues from primary wood processing mills decreased by 9 percent from 2001 to 2002.
- Wood residues accounted for 65 percent of the total wood material produced in the Central States for the pulp and particleboard industry in 2002 (table 11).
- Pulpwood production from soft hardwood⁶ roundwood fell from 51 thousand cords in

2001 to 26 thousand cords in 2002 while hard hardwood⁷ production rose from 113 thousand cords to 122 thousand cords (fig. 17, table 12).

- Exports of roundwood and residues from the Central States in 2002 accounted for 75 percent of all wood material produced in the region for pulpwood production. Roundwood exports totaled 126 thousand cords, and the export of residues from other wood-using mills totaled 194 thousand cords.

⁶ Hardwood species with an average specific gravity of 0.50 or less.

⁷ Hardwood species with an average specific gravity greater than 0.50.

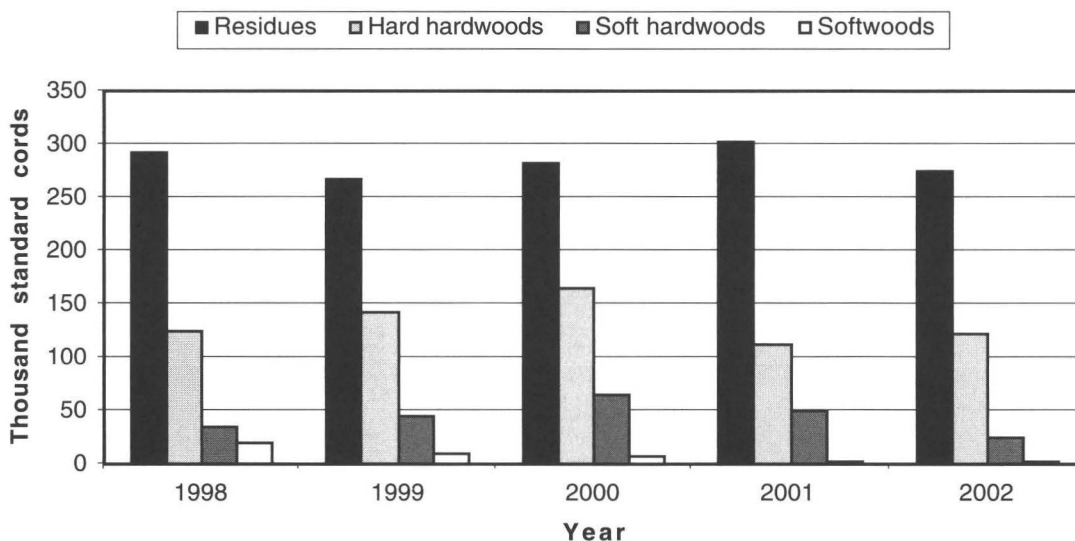


Figure 17.—Pulpwood production in the Central States, 1998-2002.

- Loggers harvested pulpwood in 20 counties in Illinois, 12 counties in Indiana, 5 counties in Iowa, and 14 counties in Missouri (fig. 18).
- Pulpwood production from whole-tree chips decreased by 55 percent between 2001 and 2002. The 24 thousand cords of whole-tree chips made up 16 percent of the total roundwood produced in the Central States in 2002.

Illinois

- Illinois does not have any primary wood pulp or particleboard mills; consequently, all pulpwood harvested and residues produced by primary wood-processing mills, which are utilized by pulp or particleboard mills, are shipped to plants outside the State.
- Illinois produced 59 thousand cords of pulpwood in 2002, a decrease of 21 percent from the previous year (table 13).
- Illinois produced the second largest volume of pulpwood roundwood in the Central States in 2002, supplying 39 percent of the Central States' total roundwood production. Pulpwood production from residues accounted for only 3 percent of the region's total residue production. Overall, Illinois contributed 16 percent of the total pulpwood produced in the Central States in 2002 (fig. 19).

Indiana

- Pulpwood production in Indiana accounted for 32 percent of the total pulpwood produced in the Central States region in 2002. The 135 thousand cords of wood material produced in Indiana in 2002 was a 16-percent decrease from the 2001 level of 160 thousand cords.

- Roundwood production decreased by over 30 percent, falling from 23 thousand cords in 2001 to 16 thousand cords in 2002. Residue production decreased by 13 percent, falling from 137 thousand cords in 2001 to 119 thousand cords in 2002.

Iowa

- Iowa's total pulpwood production in 2002 was 30 thousand cords, a decrease of almost 32 percent from 2001. The State contributed 7 percent of the region's total pulpwood produced.
- Roundwood from Iowa decreased by over 90 percent between 2001 and 2002.
- Residues accounted for over 95 percent of Iowa's pulpwood production in 2002.

Missouri

- Missouri replaced Illinois as the largest producer of pulpwood in the Central States in 2002, with 47 percent of the region's total, or 202 thousand cords. The production of pulpwood in Missouri increased by over 6 percent between 2001 and 2002.
- Missouri was the Central States' largest producer of roundwood for pulpwood and second largest producer of residues from primary wood-processing plants used for pulpwood production in 2002. The State produced 84 thousand cords of roundwood and 119 thousand cords of residues.
- Missouri exported over 90 percent (188 thousand cords) of the State's pulpwood production to mills in the Southern States.



Figure 18.—Production of pulpwood from roundwood (including chips from roundwood) in the Central States by county, in standard cords, 2002. Locations of active Central States pulp mills are shown.

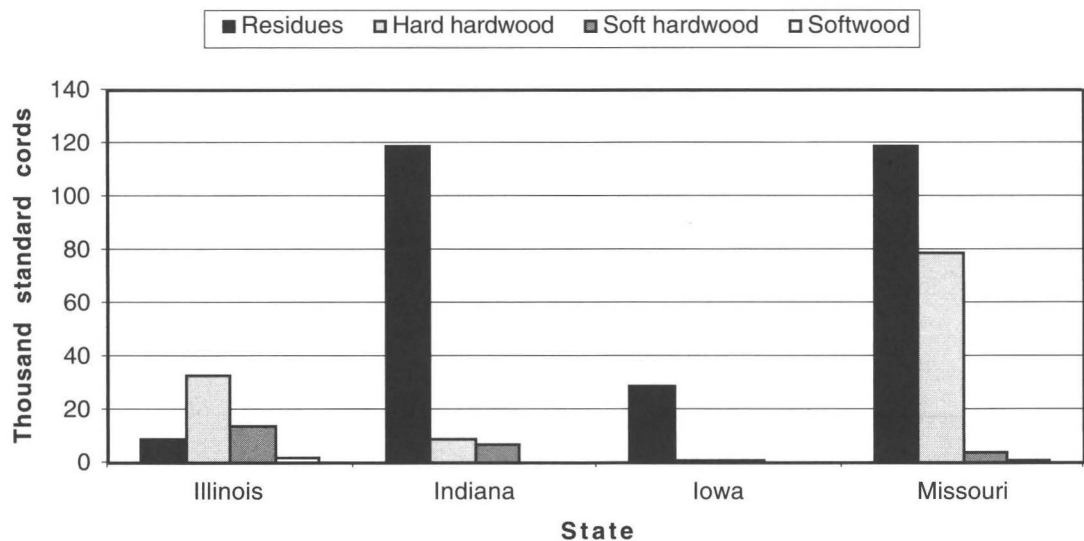


Figure 19.—Central States pulpwood production by species group and residues, 2002.

RECEIPTS

Due to the limited number of pulp mills in the Central States, individual State receipts are not reported to avoid disclosure of individual mill's receipts.

- Pulp mills in the Central States received 137 thousand cords in 2002, a decrease of almost 22 percent from 2001.
- Roundwood receipts decreased by 60 percent—from 60 thousand cords in 2001 to 24 thousand cords in 2002. Residue receipts decreased by 1 percent—from 115 thousand cords in 2001 to 113 thousand cords in 2002.
- Softwood roundwood was not used for pulpwood by the Central States pulp mills.

INDUSTRY TRENDS AND ANALYSIS

- Average daily wood pulp production decreased from 490 tons in 2001 to 473 tons in 2002 (table 14).
- In 2002, only 16 percent of the roundwood and 30 percent of the residues produced for pulpwood in the Central States went to pulp mills located in the Central States.
- Hardwood residue from sawmills and other wood-using mills accounted for 65 percent of all the wood material used by the Central States pulp mills. It continues to be the dominant form of wood material procured.

PLAINS STATES

PRODUCTION

- In 2002, the Plains States produced 123 thousand cords of roundwood and mill residues for pulpwood production, an increase of 8 percent from 2001 (fig. 20). Pulpwood came from Kansas, North Dakota, and South Dakota.
- Softwood residues accounted for 86 percent of the pulpwood production for the Plains States in 2002 (fig. 21), all of which came from South Dakota.
- The Plains States exported 5 thousand cords, or 30 percent of the total roundwood production, to Minnesota in 2002. Over half of the residues produced in the Plains States and used for pulpwood production, went to pulp or particleboard mills in Wisconsin.

- The only mill in the Plains States in 2002 was Merillat Industries, Inc. (particleboard), in Rapid City, SD, which has an annual production capacity of 95 million square feet 3/4-inch basis.

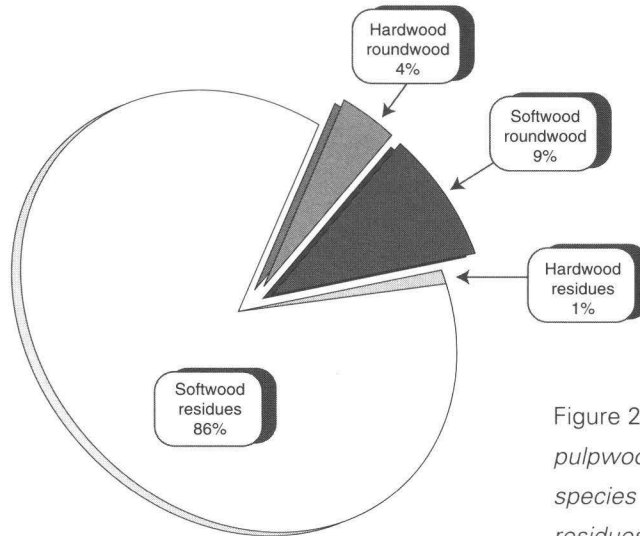


Figure 21.—Plains States pulpwood production by species group and residues, 2002.

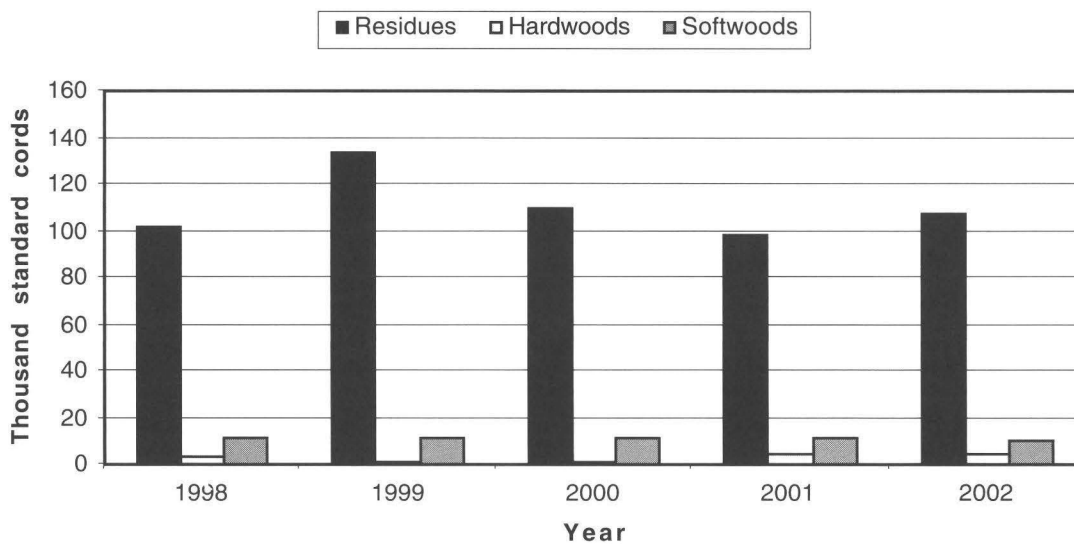


Figure 20.—Pulpwood production in the Plains States, 1998-2002.

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APPENDIX

Conversion Factors Used In The North-Central Region

Standard cords of green roundwood per green ton:

Species	Factor	Species	Factor
Softwoods	0.4688	Hardwoods (continued)	
Northern white-cedar	.6329	White birch	0.4018
Balsam fir	.4688	Yellow birch	.3723
Hemlock	.4150	River birch	.3871
Jack pine	.4688	Sweetgum	.3669
Red pine	.4688	Yellow-poplar	.4219
White pine	.4777	Blackgum	.3779
Shortleaf pine	.3956	Sycamore	.4083
Spruce	.5014	Cottonwood	.4291
Tamarack	.4291	Elm	.4018
Hardwoods	.3939	Hickory	.3701
Soft hardwoods	.4171	Hard maple	.3617
Hard hardwoods	.3708	Soft maple	.4083
Ash	.4330	Black cherry	.4688
Aspen	.4291	Red oak	.3444
Balsam poplar	.4083	White oak	.3723
Basswood	.5167	Black oak	.3444
Beech	.3956	Other hardwoods	.4777

TABLE TITLES

Table 1.—*Production and imports of pulpwood, Lake States, 2002*

Table 2.—*Lake States pulpwood production by State of origin, year, and destination, 1998-2002*

Table 3.—*Lake States pulpwood production from roundwood by State, Forest Survey Unit, and species group, 1998-2002*

Table 4.—*Lake States pulpwood production by State of origin, product form, Forest Survey Unit, and destination, 2002*

Table 5.—*Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Michigan, 2002*

Table 6.—*Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Minnesota, 2002*

Table 7.—*Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Wisconsin, 2002*

Table 8.—*Number of industrial pulp or particleboard plants in the Lake States by product form, species group used, and State, 2002*

Table 9.—*Average daily production of active wood pulp mills in the Lake States by State, company, location, and type of pulp produced, 2002*

Table 10.—*Annual production of active particleboard and panel mills in the Lake States by State, company, location, and product produced, 2002*

Table 11.—*Production and imports of pulpwood, Central States, 2002*

Table 12.—*Central States pulpwood production by product form and species group, 1998-2002*

Table 13.—*Central States pulpwood production by State and destination, 1998-2002*

Table 14.—*Average daily production of active wood pulp mills in the Central States by company, location, and type of pulp produced, 2002*

Table 1.--Production and imports of pulpwood, Lake States, 2002

(In standard cords, unpeeled)

Product form, species group, and destination	Production by State ¹			Regional Total	Imports				Total imports	Total receipts
	Michigan	Minnesota	Wisconsin		Central States	Plains States	Other U.S. ²	Canada		
Softwood roundwood										
Northern white-cedar										
Michigan	4,362	--	49	4,411	--	--	--	--	--	4,411
Total	4,362	--	49	4,411	--	--	--	--	--	4,411
Balsam fir										
Canada	6,705	--	--	6,705	--	--	--	--	--	--
Michigan	46,702	--	524	47,225	--	--	--	--	--	47,225
Minnesota	2,380	169,282	16,330	187,991	--	--	--	586	586	188,577
Wisconsin	14,580	197	54,510	69,287	--	--	--	57	57	69,344
Total	70,366	169,479	71,363	311,209	--	--	--	643	643	305,146
Hemlock										
Michigan	70,982	--	5,193	76,175	--	--	--	--	--	76,175
Wisconsin	1,111	--	18,892	20,003	--	--	--	--	--	20,003
Total	72,094	--	24,085	96,178	--	--	--	--	--	96,178
Jack pine										
Michigan	132,484	--	554	133,038	--	--	--	--	--	133,038
Minnesota	--	113,047	3,728	116,774	--	--	--	13,019	13,019	129,794
Wisconsin	2,327	6,974	200,489	209,790	7	--	--	--	7	209,797
Total	134,810	120,021	204,771	459,602	7	--	--	13,019	13,026	472,629
Red pine										
Michigan	45,366	--	917	46,282	--	--	--	--	--	46,282
Minnesota	--	38,752	5,463	44,215	--	--	--	3	3	44,218
Wisconsin	3,127	2,227	241,576	246,930	657	--	--	--	657	247,587
Total	48,493	40,979	247,955	337,427	657	--	--	3	660	338,087
White pine										
Michigan	7,757	--	76	7,833	--	--	--	--	--	7,833
Minnesota	--	1,189	58	1,247	--	--	--	--	--	1,247
Wisconsin	874	530	67,837	69,241	503	--	--	38	541	69,782
Total	8,631	1,718	67,972	78,321	503	--	--	38	541	78,862
Spruce										
Canada	4,470	--	--	4,470	--	--	--	--	--	--
Michigan	25,634	--	251	25,885	--	--	--	--	--	25,885
Minnesota	2,132	158,572	6,238	166,943	--	--	--	14,384	14,384	181,326
Wisconsin	14,818	56,209	42,447	113,474	--	--	--	8,332	8,332	121,806
Total	47,054	214,781	48,937	310,772	--	--	--	22,715	22,715	329,017

Tamarack										
Michigan	6,714	--	81	6,795	--	--	--	--	--	6,795
Minnesota	--	14,554	381	14,935	--	--	--	--	--	14,935
Wisconsin	555	12,956	15,866	29,377	--	--	--	1,303	1,303	30,680
Total	7,269	27,509	16,328	51,107	--	--	--	1,303	1,303	52,410
Total softwood roundwood										
Canada	11,175	--	--	11,175	--	--	--	--	--	--
Michigan	340,000	--	7,645	347,645	--	--	--	--	--	347,645
Minnesota	4,512	495,395	32,198	532,105	--	--	--	27,991	27,991	560,096
Wisconsin	37,392	79,092	641,617	758,101	1,168	--	--	9,729	10,897	768,999
Total	393,079	574,487	681,460	1,649,026	1,168	--	--	37,721	38,888	1,676,739
Softwood residues										
Canada	9,907	8,633	586	19,126	--	--	--	--	--	--
Michigan	163,406	--	195	163,601	--	--	--	--	--	163,601
Minnesota	--	47,302	1,921	49,224	--	--	--	252	252	49,476
Wisconsin	96,141	--	100,778	196,919	--	57,778	15,754	1,151	74,683	271,601
Total	269,454	55,935	103,481	428,870	--	57,778	15,754	1,403	74,935	484,678
Total softwood material										
Canada	21,083	8,633	586	30,302	--	--	--	--	--	--
Michigan	503,406	--	7,840	511,246	--	--	--	--	--	511,246
Minnesota	4,512	542,697	34,119	581,329	--	--	--	28,243	28,243	609,572
Wisconsin	133,533	79,092	742,395	955,020	1,168	57,778	15,754	10,881	85,580	1,040,600
Total	662,534	630,422	784,941	2,077,896	1,168	57,778	15,754	39,124	113,823	2,161,418

(Table 1 continued on next page)

(Table 1 continued)

Product form, species group, and destination	Production by State ¹				Imports				Total imports	Total receipts
	Michigan	Minnesota	Wisconsin	Regional Total	Central States	Plains States	Other U.S. ²	Canada		
Hardwood roundwood										
Ash										
Michigan	23,286	--	4,380	27,666	--	--	--	312	312	27,978
Minnesota	72	3,688	4,795	8,555	--	--	--	1,435	1,435	9,990
Wisconsin	4,471	46	71,198	75,715	--	--	--	1,649	1,649	77,364
Total	27,829	3,734	80,373	111,936	--	--	--	3,396	3,396	115,332
Aspen										
Michigan	775,045	--	30,903	805,948	--	--	--	59,689	59,689	865,638
Minnesota	1,276	1,940,288	174,289	2,115,852	--	3,094	--	197,572	200,666	2,316,518
Wisconsin	55,540	24,357	791,141	871,039	--	--	--	33,179	33,179	904,217
Total	831,861	1,964,645	996,333	3,792,839	--	3,094	--	290,440	293,534	4,086,373
Balsam poplar										
Michigan	34,266	--	1,640	35,905	--	--	--	950	950	36,856
Minnesota	17	100,328	2,773	103,118	--	118	--	22,831	22,949	126,067
Wisconsin	--	1,878	82	1,960	--	--	--	2,531	2,531	4,491
Total	34,283	102,206	4,494	140,983	--	118	--	26,312	26,430	167,413
Basswood										
Michigan	56,496	--	13,754	70,250	--	--	--	558	558	70,808
Minnesota	448	21,460	9,917	31,825	--	--	--	1,713	1,713	33,537
Wisconsin	1,716	119	34,124	35,958	--	--	--	421	421	36,379
Total	58,659	21,578	57,795	138,033	--	--	--	2,692	2,692	140,725
Beech										
Michigan	43,904	--	11,962	55,866	--	--	--	854	854	56,721
Wisconsin	184	--	2,873	3,057	--	--	--	--	--	3,057
Total	44,088	--	14,836	58,923	--	--	--	854	854	59,778
White birch										
Michigan	93,756	--	12,465	106,221	--	--	--	868	868	107,089
Minnesota	67	144,732	11,021	155,820	--	--	--	2,418	2,418	158,238
Wisconsin	10,037	21,160	194,336	225,532	--	--	--	28,031	28,031	253,563
Total	103,859	165,891	217,822	487,573	--	--	--	31,317	31,317	518,890
Yellow birch										
Michigan	37,722	--	9,421	47,143	--	--	--	670	670	47,813
Wisconsin	2,537	--	23,559	26,096	--	--	--	336	336	26,433
Total	40,259	--	32,980	73,239	--	--	--	1,007	1,007	74,246
Cottonwood										
Minnesota	--	419	--	419	--	1,743	--	--	1,743	2,161
Wisconsin	--	--	658	658	--	--	--	--	--	658
Total	--	419	658	1,077	--	1,743	--	--	1,743	2,820

Elm										
Michigan	2,104	--	--	2,104	--	--	--	--	--	2,104
Minnesota	50	650	1,781	2,481	--	--	--	63	63	2,544
Wisconsin	993	--	13,391	14,383	--	--	--	252	252	14,635
Total	3,147	650	15,172	18,968	--	--	--	315	315	19,283
Hickory										
Michigan	3,288	--	--	3,288	--	--	--	--	--	3,288
Total	3,288	--	--	3,288	--	--	--	--	--	3,288
Hard maple										
Michigan	353,761	--	67,877	421,638	--	--	--	4,818	4,818	426,456
Minnesota	1,717	9,836	28,532	40,085	--	--	--	253	253	40,338
Wisconsin	18,864	277	315,072	334,213	--	--	--	8,382	8,382	342,594
Total	374,341	10,113	411,481	795,935	--	--	--	13,453	13,453	809,388
Soft maple										
Michigan	421,393	--	74,231	495,625	--	--	--	5,292	5,292	500,916
Minnesota	1,938	58,225	86,235	146,398	--	--	--	2,571	2,571	148,969
Wisconsin	12,745	3,902	220,755	237,402	--	--	--	6,733	6,733	244,134
Total	436,076	62,127	381,222	879,424	--	--	--	14,596	14,596	894,020
Red oak										
Michigan	55,183	--	5,228	60,411	--	--	--	372	372	60,783
Wisconsin	2,498	243	135,491	138,232	10	--	--	5,050	5,061	143,292
Total	57,681	243	140,719	198,642	10	--	--	5,422	5,433	204,075
White oak										
Michigan	22,313	--	--	22,313	--	--	--	--	--	22,313
Wisconsin	995	101	42,498	43,594	5	--	--	1,953	1,958	45,553
Total	23,308	101	42,498	65,907	5	--	--	1,953	1,958	67,866
Other hardwoods										
Michigan	19,217	--	4,822	24,039	--	--	--	344	344	24,383
Minnesota	59	758	2,078	2,895	--	--	--	73	73	2,968
Wisconsin	367	--	2,629	2,996	--	--	--	--	--	2,996
Total	19,642	758	9,530	29,930	--	--	--	417	417	30,347

(Table 1 continued on next page)

(Table 1 continued)

Product form, species group, and destination	Production by State ¹			Regional Total	Imports				Total imports	Total receipts
	Michigan	Minnesota	Wisconsin		Central States	Plains States	Other U.S. ²	Canada		
Total hardwood roundwood										
Michigan	1,941,733	--	236,685	2,178,418	--	--	--	74,727	74,727	2,253,145
Minnesota	5,643	2,280,382	321,422	2,607,447	--	4,954	--	228,929	233,883	2,841,330
Wisconsin	110,945	52,083	1,847,806	2,010,834	16	--	--	88,517	88,533	2,099,367
Total	2,058,322	2,332,464	2,405,913	6,796,699	16	4,954	--	392,173	397,143	7,193,842
Hardwood residues										
Canada	--	2,614	--	2,614	--	--	--	--	--	--
Michigan	169,529	--	11,246	180,775	8,570	--	--	--	8,570	189,346
Minnesota	--	41,909	4,475	46,384	--	--	--	56,322	56,322	102,706
Other ³	--	--	5,371	5,371	--	--	--	--	--	--
Wisconsin	9,198	7,795	273,309	290,302	1,457	--	--	--	1,457	291,759
Total	178,727	52,318	294,401	525,446	10,027	--	--	56,322	66,349	583,811
Total hardwood material										
Canada	--	2,614	--	2,614	--	--	--	--	--	--
Michigan	2,111,262	--	247,931	2,359,194	8,570	--	--	74,727	83,297	2,442,491
Minnesota	5,643	2,322,291	325,897	2,653,831	--	4,954	--	285,251	290,205	2,944,036
Other ³	--	--	5,371	5,371	--	--	--	--	--	--
Wisconsin	120,143	59,878	2,121,115	2,301,136	1,473	--	--	88,517	89,990	2,391,126
Total	2,237,049	2,384,782	2,700,314	7,322,146	10,043	4,954	--	448,495	463,492	7,777,653
Total all roundwood										
Canada	11,175	--	--	11,175	--	--	--	--	--	--
Michigan	2,281,733	--	244,330	2,526,063	--	--	--	74,727	74,727	2,600,790
Minnesota	10,156	2,775,777	353,620	3,139,552	--	4,954	--	256,920	261,875	3,401,427
Wisconsin	148,337	131,174	2,489,424	2,768,935	1,183	--	--	98,247	99,430	2,868,365
Total	2,451,401	2,906,951	3,087,373	8,445,725	1,183	4,954	--	429,894	436,032	8,870,582
Total all residues										
Canada	9,907	11,247	586	21,740	--	--	--	--	--	--
Michigan	332,935	--	11,441	344,377	8,570	--	--	--	8,570	352,947
Minnesota	--	89,212	6,396	95,608	--	--	--	56,574	56,574	152,182
Other ³	--	--	5,371	5,371	--	--	--	--	--	--
Wisconsin	105,339	7,795	374,087	487,221	1,457	57,778	15,754	1,151	76,140	563,361
Total	448,181	108,253	397,882	954,317	10,027	57,778	15,754	57,725	141,284	1,068,489
Total all wood material										
Canada	21,083	11,247	586	32,916	--	--	--	--	--	--
Michigan	2,614,668	--	255,771	2,870,439	8,570	--	--	74,727	83,297	2,953,737
Minnesota	10,156	2,864,988	360,016	3,235,160	--	4,954	--	313,494	318,448	3,553,608
Other ³	--	--	5,371	5,371	--	--	--	--	--	--
Wisconsin	253,676	138,969	2,863,511	3,256,156	2,640	57,778	15,754	99,398	175,570	3,431,726
Total	2,899,583	3,015,204	3,485,255	9,400,042	11,211	62,732	15,754	487,619	577,315	9,939,071

¹ Vertical columns of figures under the box heading "Production by State" present the amount of roundwood cut or residue generated in each State.

² Mostly Western States.

³ Pulpwood shipped to mills outside of region.

Table may not add due to rounding.

Table 2.--Lake States pulpwood production by State of origin, year,
and destination, 1998-2002

(In thousand standard cords, unpeeled) ¹

MICHIGAN

Year	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other ²
1998	3,076	2,773	1	272	30
1999	3,115	2,753	5	306	50
2000	3,097	2,791	7	272	27
2001	2,898	2,570	9	299	20
2002	2,900	2,615	10	254	21
5-year average	3,017	2,700	6	281	30

MINNESOTA

Year	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other ²
1998	2,975	--	2,685	251	39
1999	3,104	--	2,851	216	39
2000	3,036	--	2,803	211	21
2001	2,839	--	2,630	187	22
2002	3,015	--	2,865	139	11
5-year average	2,994	--	2,767	201	26

WISCONSIN

Year	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other ²
1998	3,160	204	50	2,905	2
1999	3,336	206	63	3,064	2
2000	3,420	195	151	3,068	6
2001	3,309	274	133	2,898	4
2002	3,485	256	360	2,864	6
5-year average	3,342	227	151	2,960	4

¹ Includes mill residues used for pulp.

² Includes Canada.

Table may not add due to rounding.

Table 3.--Lake States pulpwood production from roundwood by State, Forest Survey Unit, and species group, 1998-2002

(In thousand standard cords, unpeeled)

MICHIGAN															
Forest Survey Unit	All species					Pine					Spruce				
	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
Eastern Upper Peninsula	590	627	575	646	629	106	110	110	118	69	25	24	19	26	19
Western Upper Peninsula	1,131	1,120	1,141	959	933	75	72	66	59	46	31	23	30	32	27
Northern Lower Peninsula	852	797	841	789	829	120	108	106	106	74	1	2	3	2	1
Southern Lower Peninsula	89	87	76	53	61	1	1	1	1	2	*	*	*	--	--
Total	2,662	2,632	2,633	2,446	2,451	302	291	283	284	192	57	50	51	61	47
MINNESOTA															
Aspen-Birch	1,119	1,171	1,210	1,171	1,233	33	27	44	59	60	110	102	125	148	145
Northern Pine	1,357	1,449	1,428	1,318	1,373	43	45	62	63	88	41	45	56	51	69
Central Hardwoods	253	237	228	180	210	20	12	10	15	14	4	1	1	1	1
Prairie	72	94	71	86	91	*	*	*	*	*	*	*	*	*	*
Total	2,800	2,951	2,937	2,755	2,907	97	84	116	138	163	156	149	182	200	215
WISCONSIN															
Northeastern	874	899	1,002	1,001	994	149	117	146	115	88	18	21	31	24	19
Northwestern	1,119	1,209	1,211	1,159	1,340	151	164	190	168	134	16	21	28	15	25
Central	652	695	650	645	634	278	290	262	270	251	3	5	4	6	3
Southwestern	87	79	87	78	80	51	51	44	31	29	2	2	2	2	1
Southeastern	33	18	25	50	39	19	13	13	15	19	2	1	2	2	1
Total	2,765	2,900	2,974	2,932	3,087	649	635	655	600	521	40	50	66	49	49
Total Lake States	8,227	8,483	8,545	8,133	8,446	1,048	1,010	1,054	1,021	875	253	249	300	309	311

(Table 3 continued on next page)

(Table 3 continued)

MICHIGAN															
Forest Survey Unit	Balsam fir					Other softwoods					Aspen				
	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
Eastern Upper Peninsula	28	31	23	26	33	22	25	24	40	32	148	165	144	153	160
Western Upper Peninsula	41	37	36	33	33	55	57	65	62	51	309	287	308	292	269
Northern Lower Peninsula	3	5	6	4	4	*	1	*	1	*	375	354	367	366	388
Southern Lower Peninsula	--	*	--	*	*	*	*	*	*	--	25	26	19	15	15
Total	72	73	64	64	70	77	82	90	103	84	857	832	838	826	832
MINNESOTA															
Aspen-Birch	101	108	110	101	94	9	10	12	25	20	736	804	780	699	754
Northern Pine	80	85	72	68	74	6	3	6	21	7	1,057	1,142	1,091	968	970
Central Hardwoods	6	1	2	1	1	1	*	*	*	*	206	204	194	147	156
Prairie	*	*	--	*	*	*	*	*	*	*	68	92	69	82	84
Total	188	194	184	171	169	16	12	18	46	28	2,067	2,241	2,134	1,895	1,965
WISCONSIN															
Northeastern	36	40	40	35	31	22	24	25	24	22	313	300	343	291	290
Northwestern	42	50	42	48	39	10	13	10	7	13	469	529	507	415	546
Central	1	1	1	1	1	2	2	2	2	4	171	203	147	137	145
Southwestern	*	*	4	*	--	*	*	*	*	2	18	14	12	12	11
Southeastern	*	*	--	*	*	*	*	*	*	*	4	1	3	10	5
Total	79	92	87	84	71	34	39	37	33	40	975	1,047	1,012	865	996
Total Lake States	339	359	335	319	311	127	133	144	182	152	3,899	4,120	3,984	3,586	3,793

(Table 3 continued on next page)

(Table 3 continued)

MICHIGAN															
Forest Survey Unit	Birch					Maple					Other hardwoods				
	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
Eastern Upper Peninsula	37	27	47	43	45	183	209	170	194	212	41	36	40	46	58
Western Upper Peninsula	71	63	110	68	71	414	460	415	308	340	136	121	112	104	95
Northern Lower Peninsula	33	30	42	31	28	172	170	209	196	239	148	127	109	83	95
Southern Lower Peninsula	*	1	1	*	1	23	28	26	16	19	38	31	28	20	23
Total	141	122	199	142	144	792	867	820	714	810	362	315	289	253	272
MINNESOTA															
Aspen-Birch	60	61	72	70	77	11	8	19	24	33	58	52	48	45	51
Northern Pine	69	74	73	71	77	1	1	16	18	25	59	53	51	58	62
Central Hardwoods	6	8	9	7	11	7	6	10	8	14	3	4	3	2	11
Prairie	*	*	*	*	1	--	1	*	--	*	4	2	2	4	6
Total	135	144	154	148	166	19	15	45	50	72	123	111	104	109	130
WISCONSIN															
Northeastern	85	89	89	91	95	158	188	212	287	332	93	120	117	132	118
Northwestern	131	128	133	110	119	195	194	207	258	333	105	110	94	138	131
Central	28	27	30	28	27	65	64	75	90	101	105	102	128	111	102
Southwestern	3	2	3	3	8	5	3	11	20	20	7	6	11	10	10
Southeastern	1	1	1	3	2	2	1	4	12	7	4	2	3	8	5
Total	248	247	257	235	252	426	451	509	666	793	314	339	351	400	366
Total Lake States	524	513	610	525	561	1,237	1,334	1,374	1,430	1,673	799	765	744	761	768

* Less than 500 standard cords.

Table may not add due to rounding.

Table 4.--Lake States pulpwood production by State of origin, product form,
Forest Survey Unit, and destination, 2002

(In thousand standard cords, unpeeled)

MICHIGAN					
Product form and Forest Survey Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other ¹
Roundwood					
Eastern Upper Peninsula	629	585	1	37	7
Western Upper Peninsula	933	811	10	111	1
Northern Lower Peninsula	829	826	--	--	3
Southern Lower Peninsula	61	60	--	--	*
Total	2,451	2,282	10	148	11
Residues	448	333	--	105	10
Total pulpwood	2,900	2,615	10	254	21

MINNESOTA					
Product form and Forest Survey Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other ¹
Roundwood					
Aspen-Birch	1,233	--	1,146	87	--
Northern Pine	1,373	--	1,362	11	--
Central Hardwoods	210	--	178	32	--
Prairie	91	--	91	*	--
Total	2,907	--	2,776	131	--
Residues	108	--	89	8	11
Total pulpwood	3,015	--	2,865	139	11

WISCONSIN					
Product form and Forest Survey Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other ¹
Roundwood					
Northeastern	994	238	5	751	--
Northwestern	1,340	7	348	985	--
Central	634	*	*	634	--
Southwestern	80	--	*	80	--
Southeastern	39	*	--	39	--
Total	3,087	244	354	2,489	--
Residues	398	11	6	374	6
Total pulpwood	3,485	256	360	2,864	6

* Less than 500 standard cords, unpeeled.

¹ Includes Canada.

Table may not add due to rounding.

Table 5.--Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Michigan, 2002

(In standard cords, unpeeled)

Forest Survey Unit and county ¹	All species	Species group										Balsam poplar
		Northern white-cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	
Eastern Upper Peninsula												
Alger	95,715	308	5,671	7,631	10,444	6,973	990	2,368	618	872	11,121	1,338
Chippewa	89,637	243	3,730	1,011	4,793	2,595	162	2,727	128	628	39,299	671
Delta	75,123	427	4,816	3,541	4,831	2,817	683	2,716	726	657	19,268	976
Luce	74,980	159	1,824	5,386	7,214	2,159	334	888	271	1,082	7,298	562
Mackinac	107,547	279	4,218	2,126	4,185	4,476	355	3,351	377	776	41,774	669
Menominee	95,670	525	9,763	4,223	3,482	2,928	969	4,575	961	764	32,710	1,433
Schoolcraft	90,160	278	3,050	2,679	5,080	3,350	445	2,000	473	1,462	8,589	855
Total	628,832	2,218	33,072	26,597	40,030	25,299	3,939	18,624	3,555	6,240	160,059	6,503
Western Upper Peninsula												
Baraga	89,688	254	3,203	9,097	1,837	1,075	407	1,887	432	897	20,405	1,782
Dickinson	107,225	361	4,758	1,891	2,956	2,728	582	2,859	619	777	48,634	2,050
Gogebic	102,056	74	2,636	6,353	554	606	132	2,281	466	2,834	19,079	364
Houghton	81,842	50	905	5,125	864	1,119	119	791	86	1,395	26,670	1,136
Iron	118,881	359	10,880	2,235	3,524	3,749	631	10,782	636	1,358	38,229	1,861
Keweenaw	46,867	39	428	1,243	287	235	63	168	67	950	6,035	259
Marquette	210,151	755	8,695	13,590	18,221	4,569	1,209	6,445	1,286	1,665	67,915	3,949
Ontonagon	176,324	57	1,890	5,834	537	399	91	1,830	97	4,581	41,664	1,141
Total	933,035	1,950	33,396	45,369	28,780	14,482	3,234	27,043	3,688	14,457	268,630	12,542
Northern Lower Peninsula												
Alcona	50,550	--	--	--	1,066	579	--	--	--	378	36,175	2,297
Alpena	27,999	--	226	--	417	101	1	74	--	184	21,295	789
Antrim	32,726	9	74	7	1,683	418	16	20	2	638	8,646	639
Arenac	13,548	--	--	--	2,590	133	26	--	--	98	6,085	175
Bay	1,104	7	58	--	--	--	--	14	--	22	492	32
Benzie	26,649	--	--	--	594	427	191	--	--	296	10,841	698
Charlevoix	10,359	--	--	--	23	--	--	--	--	228	3,541	354
Cheboygan	45,224	30	585	3	4,018	388	131	217	1	453	23,183	392
Clare	30,462	--	--	--	224	1	2	--	--	109	16,779	252
Crawford	26,659	--	--	--	7,698	345	65	--	--	128	10,421	273
Emmet	36,045	13	208	--	2,442	26	23	87	--	512	12,579	537
Gladwin	19,378	--	--	--	407	23	--	--	--	171	12,190	383
Grand Traverse	18,167	--	--	--	6,831	55	68	--	--	65	6,262	142
Iosco	13,840	--	--	--	1,148	152	4	--	--	50	8,478	161
Isabella	12,519	--	--	--	511	23	--	--	--	174	6,336	410
Kalkaska	33,438	2	18	9	1,196	797	13	7	3	293	15,277	804
Lake	18,634	--	--	--	781	262	143	--	--	105	6,178	248
Leelanau	2,176	--	--	--	--	8	--	--	--	22	907	51

Manistee	22,134	2	18	8	250	238	3	7	3	93	7,959	220
Mason	18,061	--	--	--	423	427	--	--	--	89	6,683	209
Mecosta	27,405	--	--	--	1,288	669	--	--	--	265	11,475	625
Midland	5,012	--	--	--	90	72	--	--	--	15	3,122	36
Missaukee	47,590	--	--	--	655	266	--	--	--	417	24,925	985
Montmorency	41,175	--	262	--	2,181	120	19	157	--	453	24,031	1,015
Newaygo	17,473	--	--	--	586	188	--	--	--	133	6,016	314
Oceana	10,604	--	--	--	90	46	--	--	--	60	2,608	141
Ogemaw	42,445	--	--	--	9,916	109	98	--	--	63	16,793	483
Osceola	16,752	--	--	--	--	23	--	--	--	228	6,338	538
Oscoda	14,124	2	54	8	1,462	357	61	29	3	98	6,047	199
Otsego	41,086	65	616	33	1,170	403	109	183	11	484	12,710	217
Presque Isle	43,050	64	1,520	59	2,220	73	20	366	3	312	26,033	577
Roscommon	36,780	--	--	--	10,262	250	89	--	--	23	16,557	87
Wexford	25,503	--	--	--	2,608	1,079	--	--	--	149	10,732	352
Total	828,671	194	3,639	127	64,829	8,058	1,084	1,159	26	6,808	387,695	14,633
Southern Lower Peninsula												
Allegan	8,041	--	--	--	--	--	--	--	--	10	911	25
Barry	1,660	--	--	--	--	--	--	--	--	--	168	--
Calhoun	3,787	--	--	--	--	--	--	--	--	--	382	--
Cass	1,149	--	--	--	--	--	--	--	--	--	116	--
Clinton	24	--	--	--	--	--	--	--	--	0	10	1
Eaton	52	--	--	--	--	--	--	--	--	1	21	2
Genesee	16	--	--	--	--	--	--	--	--	--	--	--
Gratiot	5,039	--	--	--	26	--	--	--	--	54	2,286	77
Huron	2,092	--	--	--	70	146	--	--	--	--	1,025	--
Ingham	200	--	--	--	--	--	--	--	--	4	83	10
Ionia	944	--	--	--	188	--	374	--	--	--	121	--
Jackson	820	--	--	--	--	--	--	--	--	--	83	--
Kalamazoo	9,351	--	--	--	--	--	--	--	--	24	1,366	34
Kent	4,191	--	--	--	--	--	--	--	--	60	1,490	85
Lapeer	198	--	--	--	--	--	--	--	--	--	164	--
Montcalm	8,898	--	--	--	362	23	--	--	--	129	4,176	303
Muskegon	5,199	--	--	--	--	--	--	--	--	16	738	37
Ottawa	886	--	--	--	--	--	--	--	--	8	215	19
Sanilac	1,200	--	260	--	90	179	--	227	--	--	422	--
St. Clair	306	--	--	--	--	--	--	--	--	--	32	--
St. Joseph	370	--	--	--	--	--	--	--	--	--	37	--
Tuscola	2,732	--	--	--	435	306	--	--	--	17	1,256	11
Van Buren	3,707	--	--	--	--	--	--	--	--	--	374	--
Total	60,863	--	260	--	1,171	654	374	227	--	324	15,477	604
State total	2,451,401	4,362	70,366	72,094	134,810	48,493	8,631	47,054	7,269	27,829	831,861	34,283

(Table 5 continued on next page)

(Table 5 continued)

Forest Survey Unit and county ¹	Species group										
	Basswood	Beech	White birch	Yellow birch	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
Eastern Upper Peninsula											
Alger	1,630	3,044	4,767	2,325	13	--	17,812	15,899	687	--	1,203
Chippewa	1,155	1,929	3,361	1,440	10	9	11,204	12,358	549	--	1,633
Delta	1,271	2,115	3,308	1,637	18	--	12,474	11,461	541	--	840
Luce	1,589	2,680	3,854	2,076	6	--	16,508	17,752	1,881	389	1,069
Mackinac	1,394	2,269	7,375	1,741	22	--	13,645	16,929	695	--	891
Menominee	2,715	1,893	3,443	1,550	81	--	11,716	10,698	491	--	750
Schoolcraft	2,057	3,548	4,891	2,753	15	--	22,150	21,870	2,619	583	1,413
Total	11,812	17,477	30,999	13,522	165	9	105,509	106,967	7,463	972	7,799
Western Upper Peninsula											
Baraga	1,628	2,756	6,081	2,330	16	--	18,480	15,237	769	--	1,113
Dickinson	3,400	2,193	3,474	1,734	18	--	13,253	13,269	778	--	890
Gogebic	3,499	2,837	5,857	3,537	325	--	24,828	22,967	1,412	21	1,395
Houghton	2,360	1,903	4,043	2,567	50	--	16,912	13,258	1,708	1	781
Iron	2,225	2,151	6,327	2,021	257	--	15,876	14,279	622	1	878
Keweenaw	1,592	2,130	2,405	1,963	*	--	13,479	13,470	1,195	--	859
Marquette	3,743	4,803	10,043	3,932	126	--	30,802	25,528	955	--	1,919
Ontonagon	6,308	2,094	7,432	7,200	195	--	68,758	19,693	5,602	--	920
Total	24,756	20,868	45,662	25,284	988	--	202,387	137,701	13,041	23	8,754
Northern Lower Peninsula											
Alcona	256	372	1,931	--	--	--	1,466	5,877	6	--	147
Alpena	352	234	913	1	1	3	686	2,587	135	--	--
Antrim	1,826	562	2,257	83	89	164	5,143	9,788	340	92	229
Arenac	135	88	747	6	7	13	402	3,043	--	--	--
Bay	24	17	68	3	4	7	103	253	--	--	--
Benzie	470	135	275	127	137	253	2,563	7,734	1,138	769	--
Charlevoix	1,218	162	135	52	56	103	1,742	2,515	77	155	--
Cheboygan	1,798	481	2,815	--	--	--	3,220	7,454	--	--	55
Clare	134	52	375	46	49	91	2,450	7,297	2,009	575	19
Crawford	169	89	520	41	44	82	996	3,785	1,978	26	--
Emmet	3,005	481	2,616	28	30	56	5,593	7,809	--	--	--
Gladwin	245	89	551	64	69	126	967	3,946	49	99	--
Grand Traverse	207	36	167	26	28	52	667	2,026	1,053	165	316
Iosco	25	51	817	--	--	--	129	2,100	--	--	725
Isabella	207	80	179	75	81	148	1,016	3,257	8	16	--
Kalkaska	1,273	185	723	83	90	165	2,511	7,236	1,689	1,065	--
Lake	126	48	98	45	49	90	2,214	5,824	1,803	621	--
Leelanau	26	10	20	9	10	19	248	679	132	36	--

Manistee	111	43	89	40	43	80	2,604	7,371	2,267	684	--
Mason	106	41	99	38	41	76	1,979	5,824	1,585	440	--
Mecosta	416	121	300	114	186	285	1,751	6,177	1,754	1,903	75
Midland	18	7	52	7	7	13	89	1,449	12	24	--
Missaukee	756	192	1,045	178	192	354	4,294	12,627	297	406	--
Montmorency	2,701	454	1,217	--	--	--	2,412	4,557	568	15	1,014
Newaygo	185	61	123	57	83	133	1,633	4,627	1,794	1,516	25
Oceana	148	27	55	26	88	106	576	3,151	1,733	1,676	71
Ogemaw	95	71	820	--	--	--	2,308	7,854	3,266	567	--
Osceola	272	104	212	98	106	195	2,192	5,271	925	250	--
Oscoda	292	126	1,015	--	--	--	866	3,285	174	47	--
Otsego	3,158	746	3,186	*	*	*	7,295	10,446	231	23	--
Presque Isle	1,208	340	2,547	--	--	--	1,896	5,325	487	--	--
Roscommon	56	12	365	9	10	18	487	6,659	1,603	293	--
Wexford	239	68	235	64	69	127	1,907	6,632	874	369	--
Total	21,259	5,583	26,568	1,321	1,570	2,758	64,401	174,465	27,985	11,831	2,678
Southern Lower Peninsula											
Allegan	106	5	10	4	78	76	61	2,304	2,011	2,351	87
Barry	22	--	--	--	17	16	--	514	434	469	21
Calhoun	51	--	--	--	40	37	--	1,172	989	1,069	47
Cass	16	--	--	--	12	11	--	356	300	324	14
Clinton	1	*	*	*	*	*	3	7	--	--	--
Eaton	2	*	1	*	*	1	7	16	--	--	--
Genesee	9	--	8	--	--	--	--	--	--	--	--
Gratiot	65	25	25	23	--	23	317	2,026	30	61	--
Huron	13	--	297	--	--	--	161	381	--	--	--
Ingham	5	2	4	2	2	4	25	60	--	--	--
Ionia	4	--	--	--	3	3	--	90	76	82	4
Jackson	11	--	--	--	8	8	--	254	214	232	10
Kalamazoo	139	11	11	10	86	89	142	2,870	2,141	2,325	102
Kent	80	28	28	26	6	31	353	1,098	346	552	7
Lapeer	--	--	27	--	--	--	--	8	--	--	--
Montcalm	166	60	121	56	69	118	754	1,985	261	304	12
Muskegon	73	7	14	7	49	52	94	1,458	1,190	1,413	50
Ottawa	16	4	7	3	9	11	46	258	135	150	6
Sanilac	--	--	--	--	--	--	--	22	--	--	--
St. Clair	--	--	--	--	--	--	43	231	--	--	--
St. Joseph	5	--	--	--	4	4	--	114	96	104	5
Tuscola	1	17	78	--	--	--	36	574	--	--	--
Van Buren	50	--	--	--	39	36	--	1,147	968	1,046	46
Total	834	159	631	133	423	521	2,043	16,943	9,191	10,482	411
State total	58,659	44,088	103,859	40,259	3,147	3,288	374,341	436,076	57,681	23,308	19,642

* Less than 1/2 cord.

¹ Includes only those counties that supplied pulpwood in 2002.

Table may not add due to rounding.

Table 6.--Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Minnesota, 2002

(In standard cords, unpeeled)

Forest Survey Unit and county	All species	Species group																	
		Balsam fir	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar	Bass- wood	White birch	Cotton- wood ²	Elm	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
Aspen-Birch																			
Carlton	47,698	2,218	978	2,466	8	1,240	535	218	33,503	932	806	2,817	--	13	264	1,679	3	3	15
Cook	43,674	974	1,333	950	48	14,756	1,566	36	20,130	150	43	3,539	--	*	7	142	--	--	*
Koochiching	420,517	32,220	17,148	782	82	60,240	10,232	16	266,532	24,970	360	6,603	--	13	102	1,201	--	--	15
Lake	85,634	5,955	3,753	3,074	70	10,253	307	248	38,924	984	1,458	12,540	--	120	653	7,157	--	--	140
St. Louis	635,542	52,688	23,918	4,650	481	58,524	7,007	1,276	394,960	15,680	2,900	51,396	--	138	4,387	17,264	80	31	161
Total	1,233,063	94,055	47,129	11,922	689	145,013	19,647	1,794	754,049	42,717	5,567	76,894	--	284	5,413	27,443	83	34	331
Northern Pine																			
Aitkin	160,614	22,755	2,094	2,376	48	11,283	2,080	434	99,241	2,982	2,388	6,458	--	68	718	7,609	--	--	80
Becker	61,211	683	2,037	565	--	159	44	7	52,944	1,127	312	3,118	--	4	17	188	--	--	5
Beltrami	204,653	6,828	16,748	1,668	--	3,376	1,682	25	144,324	18,390	1,080	9,677	--	8	54	782	--	--	10
Cass	184,169	3,660	8,635	5,585	2	3,617	239	61	131,655	2,980	1,591	20,246	--	34	473	5,351	--	--	39
Clearwater	55,185	1,106	1,137	172	--	323	44	4	47,850	1,170	477	2,891	--	--	--	11	--	--	--
Crow Wing	87,672	1,024	6,301	1,033	13	307	--	119	71,204	243	419	5,071	--	31	164	1,709	--	--	36
Hubbard	104,176	517	8,930	2,057	--	710	30	14	82,983	656	235	7,621	--	4	21	393	--	--	5
Itasca	335,715	32,957	8,093	4,807	67	35,418	1,916	192	207,063	13,390	3,419	20,578	--	90	679	6,940	--	--	105
Lake of the Woods	84,154	3,256	4,907	557	--	9,437	738	--	60,775	4,029	--	456	--	--	--	--	--	--	--
Mahnomen	16,650	4	496	21	--	54	30	*	15,258	259	1	528	--	--	--	--	--	--	--
Roseau	55,634	1,142	3,850	528	--	4,095	493	--	39,884	5,361	--	282	--	--	--	--	--	--	--
Wadena	23,087	287	4,876	473	--	26	--	5	17,053	156	6	94	93	--	1	16	--	--	--
Total	1,372,920	74,219	68,106	19,842	130	68,804	7,296	862	970,233	50,743	9,927	77,020	93	239	2,128	22,999	--	--	279
Central Hardwoods																			
Anoka	1,666	--	--	36	--	--	--	--	723	--	--	393	--	--	362	151	--	--	--
Benton	1,738	--	23	1,064	16	--	--	--	576	9	--	50	--	--	--	--	--	--	--
Carver	24	--	--	--	--	--	--	--	24	--	--	--	--	--	--	--	--	--	--
Chisago	784	8	17	150	--	25	--	10	454	8	12	9	--	2	7	73	4	3	2
Douglas	4,852	--	110	--	--	--	35	--	3,950	53	2	--	--	--	63	639	--	--	--
Goodhue	93	8	--	--	--	--	--	4	--	--	--	4	--	--	26	21	21	8	--
Houston	578	--	--	2	259	--	--	10	--	--	--	99	--	--	59	79	50	20	--
Isanti	1,475	8	52	820	--	--	--	1	590	1	2	1	--	--	--	--	--	--	--
Kanabec	16,044	8	12	10	--	--	--	64	14,691	63	663	220	--	2	26	282	--	--	2
Mille Lacs	15,763	--	--	60	469	10	--	28	12,700	58	1,612	111	--	--	64	650	--	--	--
Morrison	25,403	--	1,422	818	--	51	--	41	19,108	148	1,647	1,070	--	12	58	1,013	--	--	14
Otter Tail	15,152	--	80	7	--	--	--	--	14,704	331	--	18	--	--	1	10	--	--	--
Pine	110,475	200	1,385	5,202	8	182	459	912	77,754	2,606	1,726	9,346	--	110	1,882	8,457	84	35	128
Ramsey	235	--	--	208	--	27	--	--	--	--	--	--	--	--	--	--	--	--	--
Sherburne	592	--	40	479	12	30	--	--	21	--	--	10	--	--	--	--	--	--	--
Stearns	767	--	9	8	--	--	--	--	730	10	--	8	--	--	*	2	--	--	--
Todd	8,802	--	827	--	--	--	--	6	7,135	127	368	105	--	1	21	209	--	--	1
Wabasha	515	--	263	236	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Washington	4,000	712	53	110	119	502	--	*	2,482	10	1	8	--	--	*	2	--	--	--
Wright	818	--	4	4	--	--	--	1	776	11	2	9	--	--	1	10	--	--	--
Total	209,775	945	4,297	9,215	899	828	494	1,078	156,419	3,436	6,033	11,463	--	126	2,570	11,599	159	67	147
Prairie																			
Kittson	24,022	8	381	--	--	109	58	--	22,771	624	--	71	--	--	--	--	--	--	--
Marshall	42,532	2	108	--	--	27	14	--	37,885	4,438	--	58	--	--	--	--	--	--	--
Norman	2,535	--	--	--	--	--	--	--	2,495	--	14	--	26	--	--	--	--	--	--
Pennington	3,223	--	--	--	--	--	--	--	3,131	92	--	--	--	--	--	--	--	--	--
Polk	10,811	--	--	--	--	--	--	--	10,231	107	--	385	--	--	2	86	--	--	--
Red Lake	8,070	249	--	--	--	--	--	--	7,434	50	37	--	300	--	--	--	--	--	--
Total	91,193	260	489	--	--	136	73	--	83,945	5,310	51	515	326	--	2	86	--	--	--
State total	2,906,951	169,479	120,021	40,979	1,718	214,781	27,509	3,734	1,964,645	102,206	21,578	165,891	419	650	10,113	62,127	243	101	758

* Less than 1/2 cord.

¹ Includes only those counties that supplied pulpwood in 2002.² Includes hybrid poplar.

Table may not add due to rounding.

Tables continued on next page.

Table 7.--Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Wisconsin, 2002

(In standard cords, unpeeled)

Forest Survey Unit and county ¹	All species	Species group										Balsam poplar
		Northern white-cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	
Northeastern												
Florence	78,119	18	2,294	4,541	1,310	1,776	717	898	128	1,289	18,210	435
Forest	122,335	4	3,821	1,102	458	4,154	151	3,636	214	4,032	25,999	236
Langlade	165,062	--	6,615	327	435	3,591	260	2,991	226	7,124	31,990	78
Lincoln	140,181	--	4,047	297	1,681	3,863	682	2,634	953	5,848	56,292	15
Marinette	138,037	9	4,373	4,121	16,386	12,565	1,025	2,418	457	2,302	42,256	519
Menominee	47,239	3	81	7,661	381	794	2,426	35	4	1,923	8,842	3
Oconto	58,606	--	383	141	1,118	3,045	325	113	137	1,713	18,101	293
Oneida	110,958	9	5,750	213	2,539	7,670	2,521	3,483	884	2,887	39,412	59
Shawano	59,426	--	751	462	245	5,182	389	146	12	1,950	22,784	30
Vilas	74,019	3	2,690	78	5,948	4,680	1,837	2,420	224	2,172	26,032	77
Total	993,981	46	30,806	18,943	30,501	47,319	10,334	18,773	3,239	31,240	289,918	1,745
Northwestern												
Ashland	139,233	--	5,440	507	866	2,157	958	4,217	2,290	3,712	52,935	966
Barron	34,562	--	72	20	754	1,389	556	16	88	908	16,411	1
Bayfield	126,619	--	3,585	--	13,158	11,240	1,753	2,855	597	2,754	49,215	354
Burnett	71,640	--	282	--	11,686	5,667	1,325	126	27	679	31,950	99
Douglas	172,995	--	13,141	--	23,513	7,555	1,034	5,484	4,875	1,223	69,547	322
Iron	135,587	3	2,629	183	69	414	808	979	130	4,275	70,631	19
Polk	31,497	--	65	--	3,796	1,878	144	4	--	419	17,189	11
Price	136,729	--	6,758	569	766	2,642	661	2,956	1,480	4,441	53,051	58
Rusk	112,709	--	667	41	48	1,125	723	3,150	63	3,839	46,921	*
Sawyer	205,738	--	3,698	186	2,123	3,921	1,626	3,303	145	6,778	65,716	723
Taylor	62,805	--	2,155	456	10	792	72	1,388	970	2,435	24,739	--
Washburn	109,628	--	726	--	17,048	9,577	1,693	684	123	1,768	47,459	195
Total	1,339,741	3	39,217	1,961	73,838	48,357	11,355	25,161	10,788	33,229	545,765	2,748
Central												
Adams	66,441	--	11	--	20,419	21,699	4,649	286	297	527	2,799	--
Chippewa	42,034	--	20	11	397	1,088	427	38	28	1,169	21,511	--
Clark	56,302	--	16	392	969	2,462	570	27	2	1,246	31,025	--
Eau Claire	24,736	--	7	--	3,457	4,967	1,107	248	--	476	3,746	--
Jackson	83,810	--	--	16	18,445	10,872	4,777	39	72	1,623	11,934	--
Juneau	63,382	--	--	13	19,671	15,018	3,098	38	--	801	4,870	--
Marathon	66,713	--	760	2,283	1,924	4,498	1,564	801	26	2,192	24,329	1
Marquette	12,793	--	--	--	1,657	6,005	948	63	10	187	537	--
Monroe	31,109	--	--	--	8,962	4,567	1,613	135	86	520	2,916	--
Portage	59,314	--	302	273	11,451	14,155	5,687	297	--	792	12,738	--
Waupaca	26,715	--	19	52	297	7,825	1,710	196	--	783	5,232	--
Waushara	39,633	--	--	--	2,261	20,461	3,766	169	--	569	1,344	--
Wood	61,374	--	26	22	6,462	7,010	4,143	607	45	1,305	21,619	*
Total	634,355	--	1,161	3,062	96,373	120,626	34,059	2,943	567	12,189	144,601	1

Southwestern												
Buffalo	23,998	--	--	47	174	2,206	757	100	1,721	1,429	595	--
Crawford	2,663	--	--	--	--	194	218	15	--	161	47	--
Dunn	12,981	--	--	--	1,017	3,231	793	90	14	245	3,801	--
Grant	1,339	--	--	--	--	1,128	169	--	--	1	14	--
Iowa	2,433	--	--	--	33	479	553	107	--	46	393	--
La Crosse	3,170	--	--	--	13	1,436	128	--	--	74	596	--
Lafayette	258	--	--	--	--	247	11	--	--	--	--	--
Pepin	896	--	--	--	16	179	99	--	--	--	493	--
Pierce	1,763	--	--	--	--	157	--	--	--	130	35	--
Richland	1,263	--	--	--	15	261	144	--	--	21	419	--
Sauk	8,818	--	--	--	1,400	3,939	1,002	79	--	74	652	--
St. Croix	6,254	--	--	--	45	2,108	233	189	--	61	2,838	--
Trempealeau	8,374	--	--	--	335	4,227	1,472	171	--	78	717	--
Vernon	6,094	--	--	--	40	664	205	5	--	510	39	--
Total	80,306	--	--	47	3,087	20,456	5,785	755	1,734	2,831	10,637	--
Southeastern												
Brown	246	--	26	--	21	87	11	--	--	3	51	--
Calumet	14	--	--	--	--	14	--	--	--	--	--	--
Columbia	12,403	--	--	13	670	3,985	623	20	--	200	2,583	--
Dane	1,075	--	--	--	15	562	332	24	--	6	27	--
Dodge	173	--	--	--	--	--	--	68	--	--	105	--
Door	2,422	--	154	23	89	193	327	234	--	55	760	--
Fond Du Lac	2,164	--	--	--	12	935	956	--	--	12	56	--
Green	602	--	--	--	--	314	29	--	--	20	--	--
Green Lake	1,725	--	--	--	29	641	173	--	--	19	445	--
Jefferson	879	--	--	--	--	367	370	99	--	*	30	--
Kewaunee	306	--	--	22	--	210	75	--	--	--	--	--
Manitowoc	1,755	--	--	--	--	269	722	129	--	30	81	--
Outagamie	2,828	--	--	--	--	16	66	--	--	253	127	--
Racine	43	--	--	--	--	--	43	--	--	--	--	--
Rock	84	--	--	--	--	--	--	--	--	4	--	--
Sheboygan	3,914	--	--	--	--	1,601	879	463	--	21	666	--
Walworth	159	--	--	--	--	99	60	--	--	--	--	--
Washington	837	--	--	--	92	249	343	72	--	1	54	--
Waukesha	1,658	--	--	--	--	1,154	330	--	--	17	--	--
Winnebago	5,702	--	--	16	46	501	1,100	196	--	244	425	--
Total	38,989	--	180	73	973	11,197	6,440	1,304	--	885	5,411	--
State total	3,087,373	49	71,363	24,085	204,771	247,955	67,972	48,937	16,328	80,373	996,333	4,494

(Table 7 continued on next page)

(Table 7 continued)

Forest Survey Unit and county ¹	Species group										
	Bass- wood	Beech	White birch	Yellow birch	Cotton- wood	Elm	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
Northeastern											
Florence	2,371	2,613	3,556	2,162	--	90	16,050	17,013	1,321	281	1,046
Forest	4,932	2,650	11,991	2,939	--	801	27,101	24,147	2,545	368	1,051
Langlade	6,366	2,889	13,859	3,427	--	1,155	43,176	33,374	4,979	1,112	1,088
Lincoln	2,997	415	9,977	2,411	--	869	27,232	16,925	1,914	620	510
Marinette	3,895	1,868	6,369	2,078	--	455	16,552	15,613	3,266	753	755
Menominee	976	314	2,591	1,385	--	173	9,004	5,362	2,325	2,789	166
Oconto	2,098	1,248	3,702	1,688	--	253	11,736	10,468	1,046	390	610
Oneida	1,618	949	11,894	2,081	--	648	14,371	11,717	1,459	239	557
Shawano	514	98	2,589	335	--	217	10,165	7,600	4,192	1,725	40
Vilas	1,092	99	8,582	1,019	--	614	8,096	5,809	1,832	595	121
Total	26,860	13,143	75,108	19,526	--	5,275	183,483	148,028	24,879	8,871	5,945
Northwestern											
Ashland	4,042	76	7,632	607	--	1,002	18,346	29,470	2,562	851	597
Barron	793	16	2,473	321	--	217	3,958	3,834	2,076	626	35
Bayfield	1,754	94	12,553	991	--	415	9,878	10,943	3,026	1,176	278
Burnett	545	27	6,979	278	--	96	3,211	4,408	3,540	649	65
Douglas	1,651	3	17,472	105	--	214	7,950	16,847	1,565	336	160
Iron	1,220	468	7,664	2,141	--	759	22,295	18,154	1,628	482	634
Polk	347	12	1,257	148	--	72	1,543	1,567	2,326	692	27
Price	3,411	239	13,877	1,841	--	1,169	21,205	18,639	2,120	498	349
Rusk	2,754	97	10,235	1,066	197	890	17,239	14,628	6,779	2,160	85
Sawyer	5,905	84	15,601	896	--	1,408	30,259	45,058	12,644	4,828	837
Taylor	1,546	111	5,987	604	198	571	11,683	6,928	1,605	517	35
Washburn	2,019	12	8,116	225	--	219	6,373	8,626	3,481	1,181	102
Total	25,986	1,240	109,846	9,224	395	7,032	153,941	179,102	43,353	13,998	3,204
Central											
Adams	36	5	673	43	--	23	2,959	2,425	7,894	1,692	2
Chippewa	931	32	3,530	467	230	433	4,876	3,563	2,712	528	44
Clark	473	25	2,818	292	33	274	5,608	4,190	4,674	1,204	4
Eau Claire	192	7	1,196	146	--	113	1,987	1,529	4,780	768	10
Jackson	356	21	3,668	377	--	234	7,828	6,235	14,371	2,900	42
Juneau	48	1	938	29	--	22	4,647	3,857	8,334	1,995	2
Marathon	709	75	4,313	523	--	416	10,036	6,839	4,048	1,347	28
Marquette	1	14	200	105	--	14	895	590	1,171	369	27
Monroe	101	4	928	93	--	65	2,605	2,109	5,328	1,068	8
Portage	222	21	1,485	209	--	115	3,792	2,927	3,277	1,555	17
Waupaca	111	65	777	227	--	66	4,048	2,289	1,787	1,200	31
Waushara	26	24	689	197	--	39	2,924	2,154	3,349	1,615	46
Wood	494	7	3,000	276	--	264	5,881	4,701	4,160	1,352	2
Total	3,701	301	24,215	2,983	263	2,075	58,086	43,409	65,884	17,593	264

Southwestern

Buffalo	847	4	5,121	542	--	511	4,781	3,821	1,046	289	6
Crawford	--	14	173	104	--	14	743	465	291	199	27
Dunn	111	8	724	113	--	60	954	693	879	232	17
Grant	1	--	4	--	--	--	9	6	4	2	--
Iowa	6	--	71	4	--	4	255	213	193	76	--
La Crosse	27	1	182	28	--	18	297	224	110	35	2
Lafayette	--	--	--	--	--	--	--	--	--	--	--
Pepin	--	--	--	--	--	--	--	6	93	10	--
Pierce	--	14	142	104	--	14	557	310	136	136	27
Richland	1	--	23	--	--	--	121	102	115	42	--
Sauk	7	1	103	8	--	5	407	332	583	222	2
St. Croix	31	1	207	24	--	20	217	190	64	26	2
Trempealeau	13	4	433	39	--	11	350	244	218	54	8
Vernon	--	51	5	--	--	--	3,110	1,436	21	8	--
Total	1,045	98	7,189	966	--	657	11,801	8,040	3,752	1,333	92

Southeastern

Brown	2	--	13	1	--	1	11	16	2	--	--
Calumet	--	--	--	--	--	--	--	--	--	--	--
Columbia	99	*	593	63	--	59	761	616	1,790	329	--
Dane	--	--	6	--	--	--	32	27	33	11	--
Dodge	--	--	--	--	--	--	--	--	--	--	--
Door	11	9	97	35	--	6	256	158	11	2	--
Fond Du Lac	--	1	11	3	--	--	66	49	36	26	--
Green	10	--	64	6	--	6	69	56	21	6	--
Green Lake	3	1	34	11	--	3	84	53	155	70	2
Jefferson	--	--	*	*	--	--	5	3	2	1	--
Kewaunee	--	--	--	--	--	--	--	--	--	--	--
Manitowoc	--	1	29	4	--	--	178	140	123	49	--
Outagamie	7	24	58	14	--	5	1,481	706	42	27	2
Racine	--	--	--	--	--	--	--	--	--	--	--
Rock	--	--	4	--	--	--	26	21	21	8	--
Sheboygan	9	--	56	5	--	5	84	69	41	15	--
Walworth	--	--	--	--	--	--	--	--	--	--	--
Washington	--	--	1	*	--	--	10	6	5	2	--
Waukesha	--	1	2	2	--	--	103	49	--	--	--
Winnebago	60	16	494	136	--	47	1,002	673	568	156	21
Total	203	54	1,464	282	--	133	4,170	2,642	2,850	703	25

State total	57,795	14,836	217,822	32,980	658	15,172	411,481	381,222	140,719	42,498	9,530
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* Less than 1/2 cord.

¹ Includes only those counties that supplied pulpwood in 2002.

Table may not add due to rounding.

Table 8.--Number of industrial pulp or particleboard plants in the Lake States
by product form, species group used, and State, 2002

Product form and species group	Total Lake States	State		
		Michigan	Minnesota	Wisconsin
Roundwood				
Softwoods				
Northern white-cedar	2	2	0	0
Balsam fir	17	3	7	7
Hemlock	5	1	0	4
Jack pine	15	4	6	5
Red pine	16	4	6	6
White pine	10	3	2	5
Spruce	16	2	7	7
Tamarack	8	1	2	5
Total plants using softwoods ¹	23	4	10	9
Hardwoods				
Ash	16	6	2	8
Aspen	35	10	13	12
Balsam poplar	13	5	7	1
Basswood	19	9	5	5
Beech	9	6	0	3
White birch	27	8	10	9
Yellow birch	8	5	0	3
Cottonwood	3	0	2	1
Elm	7	3	1	3
Hickory	2	2	0	0
Hard maple	20	9	2	9
Soft maple	23	10	4	9
Red oak	11	7	0	4
White oak	8	3	0	5
Other hardwoods	7	5	1	1
Total plants using hardwoods ¹	41	11	13	17
Total plants using roundwood ¹	43	11	14	18
Residues				
Softwood	11	2	2	7
Hardwood	20	7	5	8
Total plants using residues ¹	21	7	5	9
Total plants ¹	44	11	14	19

¹ Some plants use more than one species, so numbers in columns are not additive.

Table 9.--Average daily production of active woodpulp mills in the Lake States by State,
company, location, and type of pulp produced, 2002

(In tons per 24 hours)

State and company	Location	Average daily production	Type of pulp produced				
			Sulfite	Kraft	Groundwood/mechanical	Semi-chemical	Thermo-mechanical
Michigan							
International Paper Co.	Quinnesec	1,224	--	1,224	--	--	--
Louisiana-Pacific Corp.	Alpena	250	--	--	250	--	--
Meadwestvaco Corp.	Escanaba	1,227	--	1,227	--	--	--
Menasha Packaging, LLC	Otsego	660	--	--	--	660	--
Packaging Corp. Of America	Manistee	361	--	--	--	361	--
S.D. Warren(Dba) Sappi Fine Papers	Muskegon	275	--	275	--	--	--
Smurfit-Stone Container Corp.	Ontonagon	751	--	--	--	751	--
Total	7 mills	4,748	--	2,726	250	1,772	--
Minnesota							
Boise Cascade	International Falls	1,020	--	1,020	--	--	--
Certainteed Corp.	Shakopee	242	--	--	242	--	--
Georgia-Pacific Corp.	Duluth	212	--	--	--	--	212
International Bildrite, Inc.	International Falls	100	--	--	100	--	--
International Paper	Sartell	400	--	--	--	--	400
Sappi Fine Papers (formerly Potlatch)	Cloquet	1,153	--	1,153	--	--	--
Stora Enso North America	Proctor	325	--	--	325	--	--
UPM Blandin Forestry	Grand Rapids	590	--	--	590	--	--
Total	8 mills	4,042	--	2,173	1,257	--	612
Wisconsin							
Domtar Industries, Inc.	Nekoosa	450	--	450	--	--	--
Domtar Industries, Inc.	Port Edwards	250	250	--	--	--	--
Fraser Papers, Inc.	Park Falls	170	170	--	--	--	--
Georgia-Pacific Corp.	Phillips	75	--	--	75	--	--
International Paper Co.	Kaukauna	400	--	400	--	--	--
Mule-Hide Mfg. Co., Inc.	Cornell	250	--	--	250	--	--
Packaging Corp. Of America	Tomahawk	1,378	--	--	--	1,378	--
Stora Enso North America	Biron	400	--	--	--	--	400
Stora Enso North America	Kimberly	50	--	--	50	--	--
Stora Enso North America	Niagara	250	--	--	250	--	--
Stora Enso North America	Stevens Point	200	--	--	--	--	200
Stora Enso North America	Wisconsin Rapids	1,200	--	1,200	--	--	--
Wausau-Mosinee Paper Corp.	Brokaw	258	258	--	--	--	--
Wausau-Mosinee Paper Corp.	Mosinee	275	--	275	--	--	--
Weyerhaeuser Co.	Rothschild	163	163	--	--	--	--
Total	15 mills	5,769	841	2,325	625	1,378	600
Lake States total	30 mills	14,559	841	7,224	2,132	3,150	1,212

Table 10.--Annual production of active particleboard and panel mills in the Lake States
by State, company, location, and product produced, 2002

(In million square feet 3/4-inch basis)

State and company	Location	Product produced	Annual production
Michigan			
Georgia-Pacific Corp.	Gaylord	Particleboard	204
Louisiana-Pacific Corp.	Newberry	Oriented strand board	65
Louisiana-Pacific Corp.	Sagola	Oriented strand board	185
Weyerhaeuser Co.	Grayling	Oriented strand board	249
Total	4 mills		703
Minnesota			
Louisiana-Pacific Corp.	Two Harbors	Oriented strand board	60
Northwood Panelboard Co.	Solway	Oriented strand board	211
Potlatch Corporation	Bemidji	Oriented strand board	265
Potlatch Corporation	Cook	Oriented strand board	207
Potlatch Corporation	Grand Rapids	Oriented strand board	167
Trusjoist A Weyerhaeuser Business	Deerwood	Engineered wood products	n/a
Total	6 mills		910
Wisconsin			
Louisiana Pacific Corp.	Tomahawk	Oriented strand board	64
Louisiana-Pacific Corp.	Hayward	Oriented strand board	250
Marshfield Doorsystems	Marshfield	Particleboard	80
Rodman Industries	Marinette	Particleboard	8
Total	4 mills		402
Lake States total	14 mills		2,015

Table 11.--Production and imports of pulpwood, Central States, 2002

(In standard cords, unpeeled)

Product form, species group, and destination	Production by State ¹				Regional Total	Imports		Total imports	Total receipts
	Illinois	Indiana	Iowa	Missouri		Lake States	Other U.S.		
Roundwood									
Softwoods									
Lake States	1,168	--	--	--	1,168	--	--	--	--
Southern States	1,309	--	--	955	2,264	--	--	--	--
Total	2,476	--	--	955	3,432	--	--	--	--
Soft hardwoods ²									
Central States	5,004	6,535	568	1,448	13,555	--	--	--	13,555
Southern States	9,487	529	--	2,213	12,229	--	--	--	--
Total	14,491	7,064	568	3,661	25,783	--	--	--	13,555
Hard hardwoods ³									
Central States	2,696	7,139	726	253	10,814	--	--	--	10,814
Lake States	16	--	--	--	16	--	--	--	--
Southern States	30,343	1,583	--	78,845	110,771	--	--	--	--
Total	33,055	8,722	726	79,097	121,600	--	--	--	10,814
Total all roundwood									
Central States	7,700	13,674	1,294	1,700	24,369	--	--	--	24,369
Lake States	1,183	--	--	--	1,183	--	--	--	--
Southern States	41,139	2,111	--	82,013	125,263	--	--	--	--
Total	50,022	15,785	1,294	83,714	150,815	--	--	--	24,369
Residues									
Softwoods									
Central States	--	--	--	--	--	--	26,080	26,080	26,080
Southern States	--	--	--	1,860	1,860	--	--	--	--
Total	--	--	--	1,860	1,860	--	26,080	26,080	26,080
Hardwoods									
Central States	1,376	39,906	27,569	12,730	81,580	5,371	--	5,371	86,951
Lake States	--	8,570	1,457	--	10,027	--	--	--	--
Northeastern States	--	4,900	--	--	4,900	--	--	--	--
Southern States	7,701	66,037	--	103,974	177,711	--	--	--	--
Total	9,077	119,413	29,026	116,704	274,219	5,371	--	5,371	86,951
Total all residues									
Central States	1,376	39,906	27,569	12,730	81,580	5,371	26,080	31,451	113,031
Lake States	--	8,570	1,457	--	10,027	--	--	--	--
Northeastern States	--	4,900	--	--	4,900	--	--	--	--
Southern States	7,701	66,037	--	105,834	179,571	--	--	--	--
Total	9,077	119,413	29,026	118,564	276,079	5,371	26,080	31,451	113,031
Total all wood material									
Central States	9,076	53,580	28,863	14,430	105,949	5,371	26,080	31,451	137,400
Lake States	1,183	8,570	1,457	--	11,211	--	--	--	--
Northeastern States	--	4,900	--	--	4,900	--	--	--	--
Southern States	48,839	68,148	--	187,847	304,835	--	--	--	--
Total	59,099	135,198	30,320	202,277	426,895	5,371	26,080	31,451	137,400

¹ Vertical columns of figures under the box heading "Production by State" present the amount of roundwood cut or residue generated in each State.

² Hardwood species with an average specific gravity of 0.50 or less.

³ Hardwood species with an average specific gravity greater than 0.50.

Table may not add due to rounding.

Table 12.--Central States pulpwood production by product form
and species group, 1998-2002

(In standard cords, unpeeled)

Product form and species group	1998	1999	2000	2001	2002
Roundwood					
Softwoods	18,680	10,283	7,643	2,110	3,432
Soft hardwoods ¹	34,475	46,232	64,036	50,939	25,783
Hard hardwoods ²	126,197	141,997	165,994	113,062	121,600
Total	179,351	198,511	237,673	166,111	150,815
Residues					
Softwood	38,176	19,773	12,849	117	1,860
Hardwood	254,747	247,244	269,603	302,510	274,219
Total	292,923	267,017	282,452	302,627	276,079
Total all wood material	472,275	465,528	520,125	468,738	426,895

¹ Hardwood species with an average specific gravity of 0.50 or less.

² Hardwood species with an average specific gravity greater than 0.50.

Table may not add due to rounding.

Table 13.--Central States pulpwood production by State and destination, 1998-2002

(In thousand standard cords, unpeeled)

Year	Illinois			Indiana			Iowa			Missouri		
	Destination			Destination			Destination			Destination		
	Total	Central States	Other States	Total	Central States	Other States	Total	Central States	Other States	Total	Central States	Other States
1998	79	20	59	183	68	115	34	29	5	176	13	163
1999	79	22	58	176	73	102	33	29	4	177	12	166
2000	92	32	60	168	70	98	48	46	1	212	17	195
2001	75	22	53	160	67	93	44	43	1	190	14	175
2002	59	9	50	135	54	82	30	29	1	202	14	188

Table may not add due to rounding

Table 14.--Average daily production of active woodpulp mills in the Central States
by company, location, and type of pulp produced, 2002

(In tons per 24 hours)

Company	Location	Average daily production	Type of pulp produced		
			Groundwood/ mechanical	Semi- chemical	Thermo- mechanical
International Paper Co.	Terre Haute, Indiana	215	--	215	--
Box USA	Fort Madison, Iowa	122	--	122	--
Jeld-Wen Fiber Of Iowa	Dubuque, Iowa	76	76	--	--
Huebert Brothers Products, LLC	Booneville, Missouri	60	--	--	60
Central States total	4 mills	473	76	337	60

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Piva, Ronald J.

2005. **Pulpwood production in the North-Central Region, 2002.** Resour. Bull. NC-239.

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Discusses 2002 production and receipts in the Lake, Central, and Plains States. Shows Michigan, Minnesota, and Wisconsin production by species for each county and compares production by Forest Survey Unit with that of previous years. Presents production data for Illinois, Indiana, Iowa, and Missouri by species group and product form. Includes 2002 production for the Plains States by species group and product form.

KEY WORDS: Roundwood, whole-tree chips, residue, pulpwood, particleboard, Michigan, Minnesota, Wisconsin, Illinois, Indiana, Iowa, Missouri, Plains States.

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